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THE MENINGEAL FORMS OF EPIDEMIC POLIO-ENCEPHALOMYELITIS

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Much has been written about the recent epidemic of poliomyelitis. Attention has been directed to many anomalous and rare types, and our general knowledge of the disease has received a tremendous extension. At the same time, however, not enough emphasis has been laid on certain forms which are probably much more frequent than has been supposed, and which in many individuals run a mild course, and are frequently overlooked, or entirely misinterpreted.

These are the meningeal types. When severe, they are mistaken for epidemic cerebrospinal meningitis, and their occurrence has in large part given rise to the notion that poliomyelitis epidemics follow those of cerebrospinal meningitis. Wickman[1] has discussed this supposed relationship in a thoroughly critical manner. Many are fatal, while again, others may be grouped with the abortive types of poliomyelitis, concerning which latter we have much to learn.

1. Wickman: Bull. et mém. Soc. méd. d. hôp. de Paris, 1909.

The Report of the Poliomyelitis Committee[2] has little to say regarding the rarer and anomalous types. Being a general report from practitioners, it would not be apt to represent the more intensive study of the disease, as has been done by E. Müller[3] in his recent monograph, or by Wickman[4] in his excellent series of studies of the Swedish epidemic.

The clinical foundations laid down by Medin in his unusually careful study of the disease have only recently received their full recognition by his fellow countryman Wickman.

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The latter author recognizes with reason at least eight fairly definite types of the disease, all of which have come under my observation. These types are as follows:

1. *The Spinal or Poliomyelitic Form.*—This is the usual type with its rich and varied symptomatology.

2. *The Acute Ascending or Descending Types.*—These correspond to the Landry paralysis type, also seen in

2. Epidemic Poliomyelitis, Report of New York, 1907, Epidemic, Nervous and Mental Disease Monograph, No. 6.

3. Müller, E.: Die spinale Kinderlähmung, 1910.

4. Studien über Poliomyelitis, 1905; Ueber die Prognose, Ztschr. f. klin. Med., 1907; Beitrag zur Kenntnisse der Heine-Medinsche Krankheit, 1907; Ueber die akute Poliomyelitis, Jahrb. f. Kinderh., 1908; Sur les prétendues relations entre le poliomyélite, etc., Bull. et mém. Soc. méd. d. hôp., 1909; Weitere Studien, Deutsch. Ztschr. f. Nervenkr., 1910; Ueber akute Poliomyelitis und Polyneuritis, Ztschr. f. d. ges. Neurol. u. Psychol., 1910; 82 Versamml. d. Königsberg, 1910; Die akute Poliomyelitis, Handbuch der Neurol., 1911.

some hydrophobias and certain neuritides, and which are usually, though not invariably, fatal.

3. *The Bulbar or Pontine Forms.*—In these the bulbar or pontine nuclei are most prominently affected. Here belong many central facial palsies, isolated eye palsies, palsies of the larynx and pharynx. Many of the fatal cases are such because of the medullary involvements. Medin and Oppenheim, respectively, have studied the bulbar and pontine forms.

4. *The Encephalitis Form.*—Strümpell has studied this type in particular. While apparently rare in our New York epidemic, nevertheless it occurred.

5. *The Ataxic Form.*—This is usually a predominantly cerebellar type, and has been seen in only a few instances.

6. *Neuritic or Neuritis-Like Form.*—This is an admittedly difficult type to diagnose, but inasmuch as neuritis is usually rare in children—excepting diphtheria—its occurrence at the time of an epidemic should throw light on the diagnosis.

Charcot and repeated in our text-books, must be absolutely dismissed. Poliomyelitis is an acute infectious disease with a meningomyelitis as its most fundamental pathologic foundation.

Hence, practically all of the patients will show some signs of meningeal involvement in their early stages. Irritative phenomena of the spinal nerves, with hyperesthesia, tenderness, irritability, restlessness, etc., are the most frequent signs of this spinal meningitis, whereas photophobia, hyperacusis, headache, somnolence indicate the implication of the cerebral meninges.

Those patients, however, who show much more marked meningeal symptoms than spinal, and in whom both exist, with greater prominence of the former, may be said to be suffering from the meningeal form of the disease.

SYMPTOMS

The chief signs in the meningeal forms vary, in their initial stages, from those of the spinal type, only in the matter of greater severity. There is headache, nausea

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7. *The Meningitic Form.*—This will form the subject-matter of this short communication.

8. *The Abortive Forms.*—Wickman roughly estimates that these constitute 15 to 20 per cent. of all the cases, and Müller regards them as occurring more frequently than all the other forms. If Müller's position be true, we have an intensely practical problem before us. It will be imperative for us to devise rapid and accurate methods of diagnosis of these abortive cases if an epidemic is in progress, and prophylactic measures must be put into operation to prevent the spread of the disease through these abortive cases. That they can be the direct means for the communication of the disease has been abundantly proved by most modern students of the disorder, more particularly by Wickman and by Müller.

THE MENINGITIC FORM

In epidemic poliomyelitis of the spinal type the spinal and cranial meninges are almost invariably affected. This one fact has come out with striking prominence in all of the recent studies. The notion that the disease is a toxemia affecting the anterior horn cells, taught by

and vomiting, slight photophobia with hyperacusis, pains in the neck and back, stiffness of the neck, rigidity of the muscles of the vertebral column, opisthotonos of milder or severe grade, Kernig's sign, tonic or clonic convulsive movements; somnolence and even unconsciousness. The temperature runs a non-characteristic course.

While in the ordinary spinal type the disease develops in classical fashion, in the meningitic form it may recede rapidly, and beyond the possible occurrence of transitory or permanent eye palsies nothing remains. In some cases death ensues with the development of stormy symptoms.

In the Vienna epidemic of 1908-1909, Spieler observed at least eight meningeal forms in a series of forty-four cases; in four of these the picture resembled tuberculous meningitis so very closely as to be diagnosed only late in the disease. Spieler describes some of his cases in a very characteristic manner. The cases very frequently have a comparatively lengthy prodromal period, with beginning change in mood, fatigue, nightly unrest with frequent outcries, occasional vomiting with obstipation,

suggestive of a beginning basilar meningitis. Then, in children, convulsions suddenly occur, marked stiffness of the neck, irregular pulse, Kernig's sign, increasing patellar reflexes which usually diminish later, facial pareses, strabismus, general hyperesthesia, vasomotor disturbances and atypical facies cerebralis. At this period the lumbar puncture will show lymphocytosis, but no purulent exudate. In the favorable cases the symptoms then begin to recede, the temperature falls to normal, the irritative phenomena diminish, and there may develop a number of the palsies characteristic of the spinal form.

Netter found the meningitic form comparatively frequent in the Paris epidemic, and it is not at all unlikely that in the epidemic of cerebrospinal meningitis of 1905-6 in New York many cases of poliomyelitis went under the guise of a meningitis.

The following case history is representative of a group of cases which have been observed by me in the recent epidemic. I am indebted to Dr. F. C. Lewis of Lakewood for the privilege of seeing the patient in consultation.

CASE REPORT

History.—The patient, Mrs. H. C., aged 29, a healthy, strong woman, mother of three healthy children, had been perfectly well all summer. August 31 she was attending a county fair in upper New York. Toward the latter part of the afternoon she began to feel tired, found it difficult to walk, and complained of a severe headache. On the way home from the fair she was very tired. Notwithstanding some headache the patient slept fairly well that night on arriving at home. The next day she felt ill, was very dizzy, had some nausea and vomiting, and toward evening noted that she could not see so well as formerly. She had severe headache, her neck felt very stiff, she had nausea and vomiting and considerable hyperesthesia. The next day she saw double, was very dizzy, could not stand up, was nauseated and vomited, had much pain in the head and back of the neck and was very stiff in the neck and shoulders. The bladder and rectum were uninvolved. She was first seen by Dr. Lewis, Sept. 4, 1910. She then had grown steadily worse. The temperature was 100 F., pulse 120, small and regular. The headache was intense, chiefly suboccipital. There was a marked nystagmus, and palsy of the external rectus.

Examination.—I saw the patient the next day. She was then confined to bed, had a severe headache, head painful on percussion, and on movement. She was nervous and irritable, had marked photophobia, hyperacusis, some lethargy and drowsiness. The temperature was 102 F., pulse 120. Examination of the cranial nerves was negative, save in the following particulars. The movement of the eyes to the right was limited; the left eye was in a slightly external and upward position, and the left eyelid showed slight ptosis, and moved slowly. There was distinct nystagmus. There was distinct miosis, and the pupillary light and accommodation reactions were markedly diminished. The pupils were almost immobile. There were no other palsies, save at times a slight flattening of the right nasolabial fold. The upper extremities showed no atrophy, hypertrophy, spasm or hypotonus. The reflexes were present and equal, and there were no sensory disturbances. The trunk showed no abnormalities, the reflexes were present. The lower reflexes showed no anomalies save weakness, slight diminution in the knee-jerks, the left being absent, and no sensory disturbances. No positive Kernig. The vomiting had ceased.

Course of Disease.—The day following the temperature had dropped to normal, and improvement began. There was some loss of power of convergence, and the patient's attempts to look at her nose—and also psychic attempts to look at close objects—developed nystagmus.

September 7, pains and nystagmus had diminished; eye palsies about the same. There was muscular twitching this day and thereafter, and marked dizziness on looking downward.

From September 8 to 12 improvement was gradual. The head remained heavy but did not ache. The temperature remained normal. She still had diplopia and occasional nausea and vomiting.

September 16, the patient was able to be up and about for a time. She was easily fatigued. The ocular palsies were somewhat improved but still remained evident. Vision was normal for either eye alone.

Whereas the chief palsies here belonged to the oculomotor group, the appearance of the patient strongly resembled that of a meningitis patient. It was at first thought that this was the disorder, since it was learned that about seven to ten days previously the family had been visited by a male acquaintance who had been visiting a family across the mountain, four miles distant, where there were reported to be two children suffering from epidemic cerebrospinal meningitis.

Later investigation revealed that the children had poliomyelitis, being two links in the chain of epidemic extension of this disease in its ascent up the Hudson river and Champlain valleys.

The diagnosis, I believe, was one of the meningeal forms of poliomyelitis, the permanent or semipermanent palsies being those of the mid-brain. Had it not been for the marked meningeal signs one could just as well arrange it with the mid-brain types so well written on by Williamson, or the oculomotor types described by Stephenson.

THE URINE IN A CASE OF ACROMEGALY

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In a female patient suffering from well-marked and typical acromegaly of four years' duration, a constant excretion of creatin has been observed. The excretion varied from a minimum of 52 mg. to a maximum of 500 mg., the average excretion being between 100 and 150 mg. a day. The great variation in the amount of daily excretion is undoubtedly largely due to the impossibility of obtaining satisfactory twenty-four-hour samples, the patient being up and about during the whole period of observation.

TABLE 1.—TOTAL DAILY OUTPUT OF NITROGEN, CREATININ AND CREATIN

Date	Diet	Quantity in 24 Hours, c.c.	Total N, gm.	Creatinin, mg.	Creatin, mg.	Creatin, % of Total Creatinin
2/2	Bread and milk..	630	7.258	380	105	21.68
2/3	Bread and milk..	660	8.767	343	112	24.61
2/6	Bread and milk..	980	.....	559	500	47.21
2/7	Bread and milk..	385	.....	385	104	21.27
2/8	Bread and milk..	425	.....	391	86	18.03
2/22	Full diet	1,170	9.589	866	164	15.92
2/23	Full diet	585	4.011	369	87	19.08
2/24	Full diet	1,040	6.811	572	52	8.32
2/25	Full diet	1,010	7.000	626	111	15.06
2/26	Full diet	800	7.200	544	176	24.44
2/27	Full diet	900	3.843	333	63	15.91
2/28	Full diet	765	5.076	434	91	17.31
3/1	Full diet	290	2.977	287	80	21.80
3/2	Full diet	600	3.990	462	*	.....
3/20	Full diet	1,250	.....	463	399	43.97
3/23	Full diet	500†	.....	375	120	25.00

* Not estimated. † Six-hour sample.

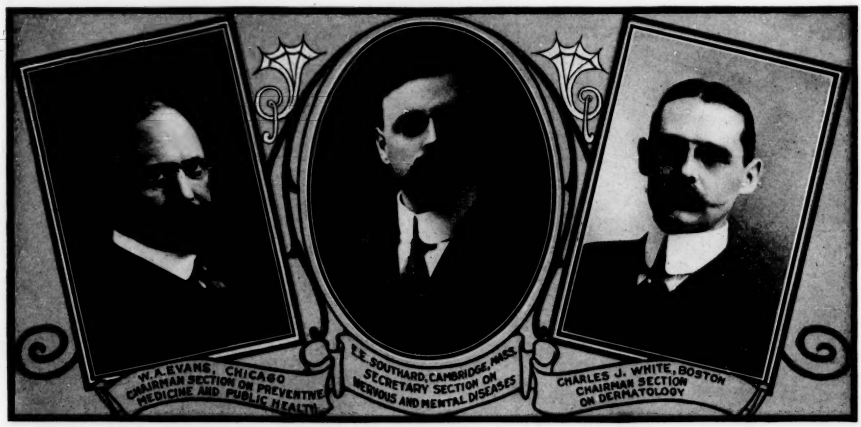
The daily output of total nitrogen, creatinin and creatin is given in Table 1. The creatinin and creatin were both determined by the Folin method; total nitrogen by the Kjeldahl method.

From these figures it can be seen that there was a constant excretion of creatin during the period in which the patient was under observation; that this excretion, while not constant, tended to constitute about 20 per cent. of the total creatinin determined, and that the average output was not influenced by the change from a bread-and-milk to a full diet.

Three determinations of the distribution of the total nitrogen excreted were also made, the first two with the patient on a bread-and-milk, the third on full diet. The results are given in Table 2. The only abnormalities noticed are the low figures obtained for creatinin and the apparent tendency to a high value for the undetermined nitrogen.

The observation of the excretion of creatin in a case of acromegaly seems particularly interesting in view of the recent finding by Krause[1] of a constant excretion of creatin in human diabetes mellitus and in phlorhizin glycosuria in dogs. Krause is inclined in these cases to associate the excretion of creatin with the deprivation of carbohydrates in the food, a condition which Cathcart[2] has shown leads to creatin in the urine. Cushing[3] has recently drawn attention to the close relation of the secretion of the posterior lobe of the pituitary gland to the storage of carbohydrates. The frequency of glycosuria in acromegaly, a condition resulting probably from the hyperactivity of this gland, has long been known. In our patient there was, however, no lack of carbohydrate in the food, nor was there apparently any diminished tolerance for carbohydrates, the ingestion of 100 gm. of glucose on two occasions leading to no appearance of sugar in the urine.

Other conditions in which creatin has been discovered in the urine are starvation, carcinoma of the liver, pro-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1. Krause, R. A.: The Excretion of Creatin in Diabetes, Quart. Jour. Exper. Physiol., 1910, iii, 289; Jour. Physiol., Proc. Physiol. Soc., July 9, 1910.

2. Cathcart, E. P.: Jour. Physiol., 1910, xxxix, 311.

3. Cushing, H., and Goetsch, E.: Am. Jour. Physiol., 1910, xxvii, 60.

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gressive muscular dystrophy and pregnancy. All these conditions, except the last, are associated with varying degrees of emaciation and loss of muscle-tissue, which may well be the cause of the creatinuria. My patient, during the two months she has been under observation, does not appear to have lost weight, but, on the contrary, is, in her own opinion, stouter.

Benedict and Myers[4] have pointed out the possibility of the changing of creatinin into creatin by the action of bacteria in the urine. As I had already found in this urine organisms capable of changing nitrates into nitrites and hippuric acid into benzoic acid and glycoll, I thought it possible that the presence of creatin was due to such a bacterial action. Such an origin for the creatin was, however, eliminated, as samples of the urine incubated at 35 c. for twenty-four hours showed no increase in the creatin present, nor did inoculation with the patient's urine and subsequent incubation produce creatin in creatin-free urine.

There was also found in the urine of this patient a reducing substance, the nature of which I have as yet been unable to determine. This substance reduces Nylander's solution in a typical manner, Haines and Fehling's atypically. It does not ferment and never yields an osazone. The orcein and phloroglucin reactions are negative, as is also Bial's test for pentoses. On several occasions a furfurol reaction was obtained, but this was never sufficiently strong to justify the assumption that the reduction was due to glycuronic acid compounds. The reducing substance is completely precipitated by basic, partially by neutral lead acetate. On extracting the urine with ethyl acetate it entirely disappears, neither residue nor distillate showing any reduction. The urine is faintly levorotatory.

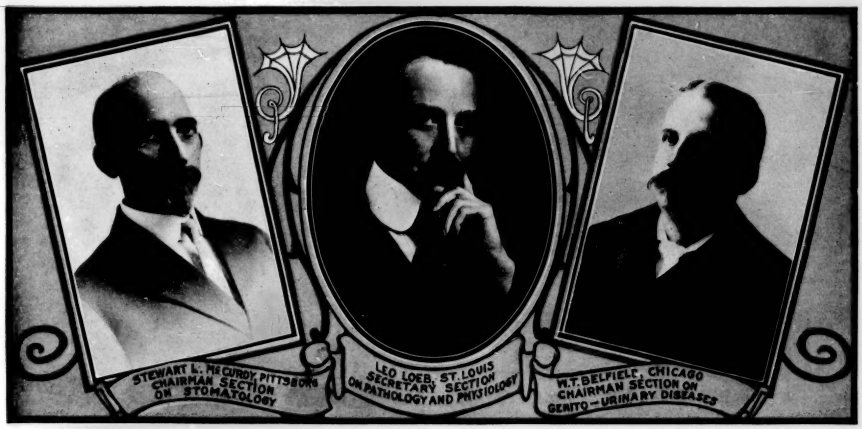
Whether the excretion of creatin in acromegaly is a constant occurrence, and what its significance may be, remains, of course, still to be determined. I have, however, thought its occurrence in this one case worth recording.

TABLE 2.—DISTRIBUTION OF TOTAL NITROGEN EXCRETED ON A BREAD-AND-MILK DIET AND ALSO ON A FULL DIET

Date	Diet	Amount, c.c.	Total N. gm.	Urea N.	N as NH_3	Uric Acid N.	Creatinin N.	Undetermined N.
2/2	Bread and milk..	940	7.258	5.705 gm.	0.309 gm.	0.151 gm.	0.204 gm.	0.889 gm.
				77.76 %	4.21 %	2.05 %	2.79 %	12.39 %
2/9	Bread and milk..	980	8.767	7.467 gm.	0.455 gm.	0.194 gm.	0.177 gm.	0.474 gm.
				85.16 %	5.19 %	2.22 %	2.02 %	5.23 %
2/22	Full diet	1,170	9.589	7.405 gm.	0.654 gm.	0.255 gm.	0.322 gm.	0.953 gm.
				77.22 %	6.80 %	2.65 %	3.36 %	9.97 %

I wish to express my thanks to Dr. Graham Chambers for his kindness in allowing me to examine the urine of his patient, and to Prof. J. B. Leathes, under whose direction this work has been carried on. The clinical excerpts of the case will be reported independently.

4. Benedict, F. G., and Myers, V. C.: Am. Jour. Physiol., 1908, xviii, 397.



A CASE OF PRIMARY ENDOTHELIOMA OF THE GREAT OMENTUM *

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The occurrence of primary sarcoma of any form in the omentum is so rare that Bonamy and Bonamy[1] in 1908 were able to collect reports of but sixteen well-authenticated cases. In these, eleven of the tumors were spindle-celled, one was round-celled, three were myxosarcomata and one a fibrosarcoma. Cobb[2] two years earlier had been able to collect reports of fourteen cases, four of which were not in the list given by the Bonamys. Since then reports by Conforti[3] (four cases), Marcialis,[4] Lichkus[5]

* Presented before the Pathological Society of Philadelphia, March 23, 1911.

1. Bonamy, R., and Bonamy, E.: Rev. de gynéc. et de chir. abd., 1908, xii, 285.
2. Cobb: Ann. Surg., 1906, xliv, 16.
3. Conforti: Centralbl. f. allg. Path., 1906, xvii, 817.
4. Marcialis: Riforma med., 1909, xxv, 1328.
5. Lichkus: Russk. Vrach, 1909, viii, 39.

and Frew[6] have been made. Many of the earlier reports are lacking in detail and it is difficult to draw conclusions from the few in which important differential points are mentioned.

Clinically the condition appears to affect the white race most commonly, only one exception being recorded, the case of Frew occurring in a Chinaman. In twenty-eight cases sex has been mentioned, twenty-one being in females, seven in males. In twenty-seven cases in which age was indicated, two patients were in the first decade, one in the third, ten in the fourth, seven in the fifth, six in the sixth, one in the seventh. Even with this small number of cases it seems safe to say that the disease affects females more commonly than males and appears particularly in the fourth, fifth and sixth decades of life, that is, between 31 and 60 years of age. Sacconaghi and Plitek[7] give the symptomatology very concisely. I enlarge somewhat in view of the details found in individual reports. The onset is insidious, the duration variable (indefinite reports, but about three months to three years), cachexia not marked, anemia moderate,

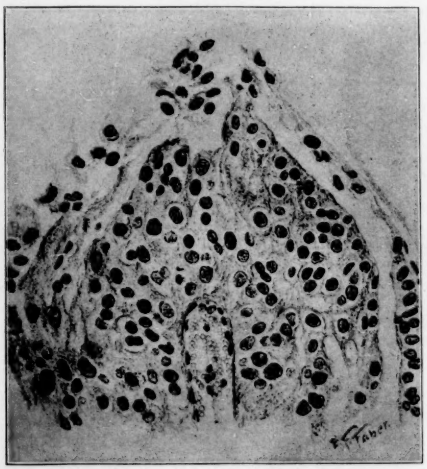

Fig. 1.—Drawing with Spencer No. 8 ocular and 4 mm. objective, showing large cells with large vesicular nuclei and a protoplasm which often takes the stain so poorly as to appear vesiculated. Note the perivascular "combing" of the cells.

wasting gradual and not severe, vague gastro-intestinal disturbance sometimes closely simulating chronic intestinal obstruction, occasionally adherence of omental mass to liver simulating enlarged liver, moderate ascites (usually clear but sometimes blood-tinged), slight edema of lower extremities, occasionally distention of superficial abdominal veins, vague abdominal discomfort rather than pain, death from asthenia.

Sacconaghi says that "it is impossible from the literature to make any pathologic-anatomic distinctions" and I agree to this. It may be said, however, that grossly the tumor is often massive, although occasionally it is flat, "platelike" in character. The case of Hasbrouck[8] was cystic. Metastasis is uncommon and invasion of other structures by direct extension is not wide-spread. The histologic reports show all varieties of sarcoma but in the later reports the large round-cell and endotheliomatous sarcomata seem to be more frequent and show much the same richness in blood-vessels and perivascular arrangement seen in the subject of the present communication. The rich blood-supply, however, is not confined to these types of tumor but is also seen in the spindle-cell forms and in two instances true perithelioma (perithelial angiosarcoma has been seen.[3], [9] In this respect it is interesting to note that one of the earliest records, that of Fränkel and Kaufmann,[10] was diagnosed as myxosarcoma telangiectodes hæmorrhagicum.

The purpose of this report is to add one more case to a number at the present time too small for satisfactory and conclusive statistical study.

REPORT OF CASE

Patient.—Mrs. P. B., female, white, married, aged 64. Private patient of Dr. George Lewis Smith, of Germantown, to

Fig. 2.—Drawing with Spencer No. 8 ocular and 16 mm. objective, showing general arrangement of vascularized trabeculæ and central cellular masses which also are vascularized.

whom I am much indebted for the privilege of using the clinical notes. Family history is negative throughout. Previous personal history shows little except the occurrence in early adult life of pulmonary tuberculosis which, however, was cured. The illness from which she died appeared to have its origin about four months before her death. She complained of indigestion and discomfort in the abdomen. The discomfort became a pain of moderate severity and the indigestion later was accompanied by nausea, vomiting and alternating attacks of severe constipation and moderate diarrhea. The constipation when present was so marked that the patient insisted that she had intestinal obstruction.

Physical Examination.—This showed moderate wasting but no definite appearance of cachectic color. The chest examination was negative. Examination of the abdomen showed slight diminution in the size of the liver and a distinct but moderate ascites. The lower extremities were negative except for slight

6. Frew: Transvaal Med. Jour., 1907-8, iii, 127.
7. Sacconaghi and Plitek: Anleitung zur Diagnostik der Abdominaltumoren, Berlin, 1910.
8. Hasbrouck: Washington Med. Ann., 1907-8, vi, 364; Ann. Surg., 1908, xlviii, 206.
9. Nash: Lancet, London, 1911, i, 17.
10. Fränkel and Kaufmann: Arch. f. Gynäk., 1889, xxxxi, 399.

edema toward the termination of the disease. These findings were concurred in by Dr. Smith and Dr. J. H. Musser.

Examinations of Urine, Blood and Feces.—By Dr. George Morris Piersol. Urine: Amber, cloudy, flocculent, acid, 1.022; faint trace of albumin by Heller test and ferrocyanid test; faint trace of albumose; no sugar; excess of indican; no bile pigments; trace of urobilin; no acetone or diacetic acid. Microscopically there were many leukocytes and epithelial cells; no casts.

Blood: Hemoglobin 70 per cent. (Tallquist); 3,830,000 erythrocytes; 7,200 leukocytes.

Feces: Thin, watery, light brown, offensive, faintly acid, hydrobilirubin, well-digested muscle fiber, no muscle nuclei, small amount vegetable fiber, much mucus and pus, no blood, occult blood or parasites. Further examination gave negative results.

Sputum: Negative for tubercle bacilli.

Necropsy.—This (by H. T. K.) was performed six hours after death. With the aid of the subsequent histologic examination, the following anatomic diagnoses have been made: Vesicular emphysema, healed tuberculosis, passive congestion of lungs; chronic focal fibrous pericarditis; brown atrophy of heart, chronic interstitial myocarditis; sclerotic-aortic, mitral, tricuspid valvulitis; simple (non-luetic) arteriosclerosis; perilobular fibrosis, passive congestion, fatty degeneration of liver; chronic fibrous cholecystitis, cholelithiasis (not demonstrably obstructive); chronic atrophic gastritis; chronic catarrhal enteritis; senile atrophy of spleen; chronic interstitial nephritis, nephrolithiasis, chronic catarrhal pyelitis; chronic interstitial pancreatitis with slight fat infiltration; endothelioma of omentum. The abdominal cavity contained about one liter of clear limpid yellow fluid; intestines were much distended with gas; transverse colon was markedly ptosed. The great omentum was densely adherent in the pelvic cavity and was diffusely thickened throughout its entire extent by the presence of a large number of spherical, generally discrete but sometimes confluent, mottled red, gray and purple, relatively firm nodules measuring from 3 mm. to 15 mm. in diameter, and averaging about 1 cm. The omentum formed a flat mass measuring 17 by 14 by 2 cm., and showing a smooth, glistening, transparent surface except where adherent to bladder, rectum and small intestine. The cut surface showed the nodules to be mottled red, purple and white, generally firm, slightly bulging, slightly bleeding, and with a few pin-head-sized areas of necrosis. Extension of the process to the gastrocolic omentum, gastrosplenic ligament, to a slight degree to the small intestine and mesentery and to the colon, especially in the epiploic appendages, was noted.

Histologic Examination.—There is found a network of connective tissue, giving the tumor a somewhat alveolated appearance. This is richly vascularized and apparently serves as the basis for outgrowth of the cells into the spaces. They are arranged in chains and multiple layers. As a rule, there is extensive necrosis in the center of the alveoli, but in numerous fields the central areas are found to have thin-walled blood-vessels from which the cells "comb out" in a typically sarcomatous fashion. The tumor cells are large, polygonal, rich in protoplasm and contain as a rule a single, large, vesicular round or oval nucleus. In some cases the nuclei are multiplied within a cell so as to overlap one another. Some few of the cells show apparent vacuolation of their protoplasm, which on more careful study is seen to be simply a lack of condensation in contrast with other areas of greater density.

The various features are illustrated in the accompanying drawings.

Diagnosis: Endothelioma of great omentum.

The Entry of Bacteria into the Lungs.—In a report made to the Philosophical Society, Cambridge, England, on experiments as to the entry of bacteria into the lungs (abstract in *Nature*, March 16), Drs. Cobbett and Graham-Smith announced that if *B. prodigiosus* were placed in the mouths of very young guinea-pigs it could be detected in the lungs examined a few minutes later. They assume that this affords an explanation of tuberculosis in animals fed with tubercle bacilli in many experiments, and invalidates certain conclusions which have been deduced as to the usual path of infection in this disease.

A NEW AIR-WATER SPHYGMOMANOMETER

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Realizing the excessive number of sphygmomanometers already on the market, I felt some trepidation in designing the sphygmomanometer to be described. It was only after I had convinced myself that the very multiplicity of types was due to their faults and limitations, that I had the present model constructed.

Sphygmomanometers are mainly of two types: (1) the mercury manometers; (2) the spring manometers.

1. The disadvantage of the mercury manometer is chiefly the loss or distortion of the pulse-wave during transmission to the instrument. Either no pulsation is obtained, or at best there is a slow oscillation, entirely distorted in both character and duration by the inertia of the mercury. The truth of this statement can be readily proved by connecting rubber-tubing to the

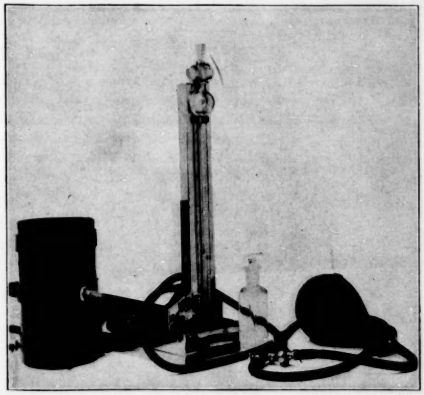

Fig. 1.—Photograph of the complete apparatus, showing tube, stand, cuff, rubber tubing and Politzer air-bag which serves as a pump.

manometer and suddenly pinching it. The mercury will rise, then fall below its previous position, and will then oscillate for some time. A single impulse has been distorted by the instrument into a series of oscillations.

2. The spring manometers have not met with favor chiefly on account of their inaccuracy after prolonged use. The spring weakens with use and is also affected by temperature. Furthermore, the price of that class of spring manometers which can be used with accuracy for any reasonable length of time is prohibitive.

To avoid the inertia of the mercury one naturally turns to the lighter fluids, such as water, alcohol, benzin, etc. But to use these fluids alone a considerable quantity is required, which exerts as great inertia as the smaller quantity of the heavier liquid, mercury. Consequently, to use only a few cubic centimeters of these lighter fluids, we must use them working against some resistance. The simplest and most elastic resistance obtainable I believe to be air compression. This principle—the compression of an enclosed column of air by a few cubic centimeters of water—is utilized in my instrument.

A glass tube of the shape shown in Figure 2 is used. The tube is filled with water until the level indicated in the illustration is reached. The stop-cock is then closed and we have an enclosed column of air above the fluid. This column of air

can be compressed by the fluid and the degree of compression can be ascertained from the scale. Pressure from the cuff is exerted on the fluid at *A*, which causes the fluid at *B* to rise until the air-pressure in the tube *C* is equal to the pressure in the cuff. This pressure may be then read off on the scale.

The bulb *A* acts as a reservoir for the fluid, while the bulb *D* acts as a reservoir for the compressed air, allowing the liquid to rise the entire length of the tube in recording pressures up to 300 mm. of mercury. These two bulbs allow of the use of a larger and hence more accurate scale than if straight tubes were used.

The rest of the apparatus is as simple as possible.

1. The cuff consists of a cloth reenforced rubber bag 12 cm. wide, closed by three rapid adjustable straps. A metal plug joins the bag with the rubber tubing.

2. The pump consists of an 8-ounce Politzer bag.

3. A metal "T" tube with stop-cock and needle-valve escape for gradually releasing the pressure. The stop-cock allows the air-pump to be disconnected, giving direct communication between the cuff and the instrument.

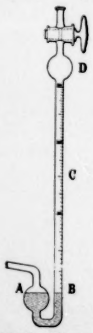

Fig. 2.—Diagram showing the glass tube of the water sphygmomanometer. A, bulb partially filled with water on which pressure is exerted by a column of air in the tube leading from the cuff. B, level of water in upright calibrated tube C, which contains air above. D, bulb in the tube C to contain the air as the water rises. At the top of the tube is a cock for closing the tube after the water is put in below.

4. The rubber tubing is heavy enough to prevent any loss of pulsation by distention of the rubber.

The advantages of the instrument are:

1. Sensitiveness. A few c.c. of water constitute the only moving part; hence there is practically no inertia. The transmission of the pulse-wave is immediate and its character is unchanged. Irregularities of the pulse are readily seen and the pulse-force may be estimated. Systolic pressure can usually be read off directly by merely watching the change in pulsation of the fluid as the pressure is gradually lowered. Furthermore, by feeling at the wrist the pulse can be sooner detected by feeling the first few throbs occurring synchronously with the pulsation in the tube. Higher, but more accurate, systolic readings are thus obtained. Similarly, the diastolic pressure can be obtained by observing at what pressure maximal pulsations occur in the tube.

2. Simplicity. Air and water constitute the only moving parts. There is nothing to wear out, hence the apparatus is permanent.

3. Accuracy. Each manometer is individually calibrated against a mercury manometer.

103 West Eighty-First Street.

Heredity, Growth and Decay.—"Heredity is a reality, but is not so definite or so mechanical as is generally supposed. Nutrition is responsible for much that passes for heredity. Only after its effects have been definitely ascertained can the real mechanism of heredity be understood. Why, for example, does each organism reach maturity and finally sink into old age? Is there a determent in the germ cell that when active checks growth? Does the mechanism of life run progressively to a certain point and then refuse to act? Or is maturity merely a state of maximum nutrition and old age a running down because nutrition fails? To state the problem in another way: Does a given organ cease to grow because the possibilities of its inherited mechanism have become exhausted, or does growth end because nutrition fails when the energy of the organism is turned in other directions? The latter is, I believe, the sounder view." (From Patten's "The Social Basis of Religion," New York, 1911.)

THE COMBINED USE OF TENTS AND INTRA-UTERINE MEDICATION

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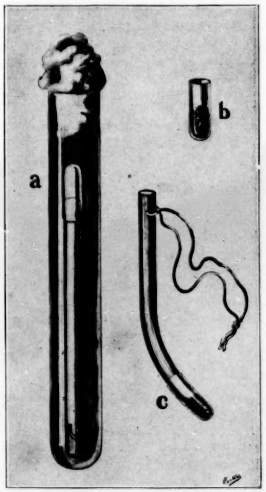
Dilatation of the uterus by means of tents and treatment by intra-uterine applications made up a very large part of the gynecologic therapeutics of a former generation. Both of these measures have fallen into almost universal disuse; the tent, although of great diagnostic and therapeutic value, having been discarded because of the frequent disabling, not to say, fatal metritis, salpingitis, and peritonitis, which, even under the most careful and judicial handling, occasionally followed its use. The old routine intra-uterine applications as used in the office or in the patient's house were condemned, not only because they were generally useless, but also and more especially because they were dangerous and sometimes destructive. Since these measures have been relegated to the dark ages of gynecology, we have for the most part put in place of them forcible dilatation by means of steel instruments, and curettage under anesthesia. Forcible dilatation popularized by our late fellow, Goodell, and others, undoubtedly has wide usefulness when used with care and judgment. Even in the hands of the incompetent and careless practitioner it will be less hazardous than the old routine treatment, because it rises to the dignity of a surgical operation and is, therefore, presumably always undertaken with aseptic conditions and because it is not so frequently repeated. Forcible dilatation is transient in its effect, and, therefore, not always adequate; furthermore, if carried far enough to permit intra-uterine digital touch, which is often desirable, serious rupture of the uterus might result. The intra-uterine application of iodin or other substances usually, since it does not reach thoroughly the uterine mucosa, especially the uterine glands, gives disappointing results. Any measure, therefore, that will safely prolong the dilatation and bring the application effectively in contact with the mucosa and muciparous glands should be of value.



Device for prolonged dilatation of the uterus in conjunction with thorough intra-uterine medication: *a*, a tupelo tent with gelatin half-capsule attached kept sterile in a test-tube; *b*, a gelatin half-capsule, containing two parts of potassium iodid and one part of iodin crystals; *c*, a curved tent on the distal end of which has been placed the half-capsule containing iodin one part and potassium iodid two parts, this being soluble in water.

The sole purpose of this paper is to describe a simple means which has the double purpose of relatively safe prolonged dilatation of the uterus by means of tents and

in conjunction therewith thorough intra-uterine medication. The device consists in the use of a tupelo sponge or sea-tangle tent over the distal end of which has been attached half of a gelatin capsule filled with whatever medicinal substance may be desired for intra-uterine application.

The diagram, with its explanation, shows, first the sterile tent over the end of which has been placed the gelatin half capsule. The tent should be kept sterile in a test-tube stopped with cotton until used. The drawing shows also another tent slightly curved to facilitate introduction and a half-capsule partly filled with a medicinal substance. Any form or size of tent may be used.

It is perhaps well to lay stress on the necessity of thorough disinfection of the tent and of keeping it aseptic until used. In my service at St. Luke's Hospital the tents are exposed to a heat of 240 F. on two consecutive days and again to the same degree of heat before using.

There is a possible defect in the iodin tent as above described, that is, in the gelatin capsule which, although subject in the manufacture to considerable heat, is not aseptic and may be a source of infection. The difficulty may be practically and perhaps wholly obviated by placing the half-capsule filled with iodin on the end of the tent two days before it is to be introduced; then the iodin permeates the capsule and renders it probably safe.

The only medicinal substance I have used so far is a combination of iodin crystals, one part, and potassium iodid, two parts, this being a proportion which dissolves readily in water. Therefore, after introduction, the expanding tent stimulates uterine secretions which dissolve, first, the capsule, and second, the iodin and potassium iodid, making at once a prolonged application to the endometrium; at the same time the iodin permeates the tent and renders it continuously antiseptic. Should the half-capsule not hold enough iodin other half capsules may be filled and placed each over the end of the preceding capsule until a sufficient quantity has been secured.

This iodin combination dissolves readily in less than one-half its weight of water; therefore, the uterine secretions stimulated by the tent are quite sufficient to effect a solution. The solution, like Churchill's caustic solution, undoubtedly would have a very escharotic effect and might, if applied, cause stenosis of the uterine ends of the Fallopian tubes. It is also possible that if the tubes were open uterine contractions might force it into the tubes with possible disastrous cauterization. Such an accident evidently would be more likely to occur in consequence of the cervical canal being tightly plugged by the tent. I have not applied more than three or four grains of this combination and would hesitate to increase this amount except in case of a very flabby hemorrhagic uterus. Manifestly it might be desirable to dilute the iodin combination in such a way as to insure the mucosa against destructive action. Such a dilution could be made with magnesium silicate, that is, talcum powder, this being comparatively an inert substance with which the iodin combined would have no chemical reaction.

This procedure is more efficacious than the obsolete one of passing an applicator armed with medicated cotton into the uterus. The explanation is, first, in the conjunction of prolonged dilatation and the continuous application of the medicinal substance; second, this application is made during a period when the uterine wall is thinned by dilatation, and the muciparous glands are correspondingly shortened and opened, and, therefore, are more accessible to treatment.

I suggest a trial of this method in such cases of uterine catarrh, uterine hemorrhage, dysmenorrhea, and sterility as may furnish an indication for dilatation and intra-uterine application. For obvious reasons it should not be undertaken at the office, but should be surrounded by all the safeguards of a surgical operation in the patient's house, or preferably in the hospital. The iodized tent may be introduced as a supplement to the forcible dilatation with steel instruments under anesthesia, in which case a somewhat larger tent may be used. If no general anesthetic is given, I suggest the following technic:

1. Cleanse the vagina to a degree as near sterilization as may be practicable.
2. Introduce into the uterus an applicator wound with absorbent cotton saturated with a 10 per cent. solution of cocain. Ten minutes usually will suffice for practical local anesthesia.
3. Carefully and moderately dilate the uterus by means of a Palmer or very small Goodell dilator.
4. Introduce the tent.
5. In about twelve hours remove the tent and follow it by a larger one if additional dilatation is desired.

In the older experience of dilatation by means of tents the dangerous infections usually followed the use of the second or third tent, seldom the first. Under aseptic conditions one might safely apply two tents in immediate succession; but if more dilatation were required I would advise it to be begun forcibly under anesthesia and then continued by one or two tents.

My estimate of the value of the device is based for the most part on general principles. I have used it only a few months and, therefore, cannot report the remote results in concrete cases. In one case a moderate pelvic inflammatory reaction followed which subsided in a few days apparently without serious results. This case serves to emphasize the necessity for extreme care in the use of any method of uterine dilatation and intra-uterine application.

I make no extreme claim relative to the value or safety of the method I have described. So far I have found it quite satisfactory. I offer it in a tentative way, hoping it may prove useful in selected cases as a supplement or a substitute for the more radical forcible dilatation. At any rate, it is about all I have been able to rescue from the ancient wreck of routine intra-uterine therapeutics, which filled a large and melancholy place in the gynecologic therapeutics of the last century.

Uterine dilatation by means of tents fell under merited condemnation before the time of antiseptic and aseptic surgery. Perhaps under modern conditions it may be found that the danger was dependent not on the tent itself, but on the unclean conditions in which it was applied. Comparing the relative value of the earlier tent dilatation with the later forcible dilatation by means of steel instruments, and eliminating the septic results which so frequently followed the use of the tent, which now possibly we may avoid, it is more than possible that forcible dilatation might suffer by comparison; clearly, it might be well to give the latter method a fair trial under the favorable conditions of antisepsis and asepsis.

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TRAUMA AS A CAUSE OF AMYOTROPHIC LATERAL SCLEROSIS

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The following cases have been studied with a view to estimating the correct relation of the trauma which in each case preceded the symptoms of amyotrophic lateral sclerosis.

CASE 1.—I examined a mechanic, aged 44, in the dispensary of the University Hospital in 1909. Five years before that date he had fallen 12 feet and injured his back sufficiently to keep him in a hospital for two months. After four years of normal health he caught his right hand in the machine which he tended, badly tearing the soft tissues, and again was forced to spend two months in a hospital. On resuming work, he immediately felt that the injured hand was weak, awkward and easily fatigued. The lameness and ensuing atrophy spread up the limb to the shoulder, so that within twelve months the right upper extremity was nearly useless, while the left hand had begun to show the early symptoms of the disease. The picture of amyotrophic lateral sclerosis rapidly developed and the patient died early this year with bulbar paralysis.

CASE 2.—A railroad engineer recently in Professor Soiller's service at the University Hospital attempted just a year ago, after a day's work, to jump on a moving train. He lost his grip and for a moment was in danger of being killed; but by a great effort he regained his hold and managed to get on the car. He lay for the rest of the two-mile run much agitated and violently trembling in his legs. Next day, however, he was able to walk and returned to work, and for two weeks all went well. Then he felt stiff and sore in the muscles of the lower limbs, and this condition progressed as time passed. Five months later, again while returning home from work, he tripped on a cross-tie and fell on a bridge, striking his left shoulder as he passed through, finally lighting on a girder five feet below. He was able, nevertheless, to draw himself back to the track and to walk home. The next day he felt dizzy and nauseated. After a few days, weakness and lameness developed in the left arm, followed by atrophy, the symptoms increasing from day to day until by October, 1910, the patient was forced to give up work. He has now the cardinal symptoms of amyotrophic lateral sclerosis.

Among the records at the Philadelphia General Hospital I find but few case histories in which the diagnosis of this disease has been made. Among the symptoms in several cases of spinal muscular atrophy are recorded spasticity of the legs, and some cases of lateral sclerosis showed muscular wasting in the arms. In two out of the whole list accident had preceded the disease:

CASE 3.—Two years before onset the patient had fallen from a moderate height. His first discomfort was a stinging paresthesia in the toes, felt several months after the injury. Later general muscular wasting appeared, together with spasticity of both legs.

CASE 4.—The patient five months before the onset had fallen from a height of 25 feet and been rendered unconscious.

CASE 5.—The case reported by Dr. George Price[1] happens to be exactly apposite. A middle-aged acrobat made a false step and sprained one ankle. Shortly afterward he sustained a slight injury from a fall. Within a short time muscular wasting appeared with some stiffness and slightly exaggerated tendon reflexes in both legs.

Gelma and Stroehlin in a report[2] on this subject tell of a workman who received a severe strain of the vertebral column while trying to support a 700 kg. stone which was slipping from the hold of a derrick. He felt weakness at once. Stiffness and atrophy succeeded and the disease went on to bulbar paralysis within three years.

Kirk Mendel[3] discusses the etiologic relation of trauma to amyotrophic lateral sclerosis, and reviews the cases reported up to that time. A patient of his, a woman, had fallen from a height of ten feet, striking her left side. Seven months later she again fell, this time from a hay-wagon, bruising her left breast. Two months later marked fatigue was felt, followed by numbness of the left upper extremity and atrophy. The symptoms were earliest and throughout most marked in the left upper extremity.

Valentiner's patient showed symptoms shortly after a fall during a violent athletic effort. Goldberg tells of a workman who fell on his buttocks from a scaffolding, and whose right foot was crushed by an after-falling tool-box. The symptoms started in the right foot and were always more severe in the right leg. Hauck's patient received a deep cut in the left forearm and right leg, and here also the injured limbs showed earliest and most severe signs of the disease. The man reported by Ottendorf had hung suspended by arms and chin for several minutes from a beam. Seven months later the disease commenced in the arms and progressed to bulbar palsy. Pagenstecher almost duplicates this history, except that his patient showed immediate symptoms. An electric shock preceded the onset in a 6-year-old boy examined by Hoehl: Oppenheim, in his text-book on nervous diseases, tells of a man who after an accident on the water was compelled to row violently to save his life.

Gowers[4] deals with spinal muscular atrophy and amyotrophic lateral sclerosis without distinction. In a few cases, he says, he has known the complex to develop after a concussion "as if it had set up a perverse nutrition of the nerve elements. Still more rarely a fall injuring one limb has been followed by muscular atrophy commencing in this limb."

Amyotrophic lateral sclerosis has been reported as following parturition.

It thus appears that many patients in whom this relatively rare spinal degeneration has occurred refer it back to some kind of trauma. If these accidents had been of the slight kind which most workmen suffer every year or so, the question of causal relation might be dismissed. But the injuries were in each case unusual, so that it is difficult to dismiss them as mere incidental antecedents. Mendel calls attention, as did Gowers, to the fact that the disease often develops first and persists most markedly in the injured member, or if not in the same limb, then on the same side of the body. In Mendel's opinion the interval elapsing between injury and early symptoms is sufficiently constant to merit consideration.

Many writers on this disease do not even mention trauma as an etiologic factor. Winterscheid thinks it possibly a proximal cause, and this is Mendel's conclusion, who feels that some congenital defect must be invoked to explain the tendency to the degeneration. The question comes up, What is there about the circumstances attending such accidents that could thus operate on the spinal cord? Two possible mechanisms suggest themselves. If the blood-supply to certain tracts and cells were congenitally precarious, a severe concus-

1. At the session of the Philadelphia Neurological Society at which this paper was read.
2. Gelma and Stroehlin: Gaz. d. hôp., March 23, 1911.
3. Mendel, Kirk: Umfall in der Aetiologie der Nervenkrankheiten, Berlin, 1911.
4. Gowers: Text-Book on Nervous System, i, 478.

sion might completely cut off part or all the nutrition of the parts involved. It must also be remembered that violent exertion usually accompanies the accidents above described, and, as Edinger has suggested in regard to tabes dorsalis, overfunctioning might undo an already weakened tract. In the various forms of professional neuritis overstimulation of nervous cells is the most obvious cause of the changes in structure.

Before attempting to reach a conclusion from these cases as to the causative value of trauma, there is another possible relationship between the disease and the accident that is worthy of consideration. The accident might be the result of the disease. A mechanic whose hand was gradually losing its wonted deftness through an incipient central degeneration in the cervical cord one day fails to remove his hand in time from his machine; an engineer, unconscious as yet of weakness in hand and leg, tries the muscles too far in the effort to jump on a moving train. The workman whose stiffness has not shown itself in ordinary walking has the defect painfully emphasized when a slight misstep throws him from a beam in midair. Siccard in discussing one of the cases above reported took a non-committal position because he could not decide from the evidence that the preexisting disease had not caused the trauma.

Patients suffering from any insidious disease are apt to overlook the early dawning of their trouble. Close questioning often enables the physician to place the onset weeks or months earlier than the patient had dated it. Very often, too, the patient assigns some unusual event as the starting-point, or even as the cause, of his illness—explaining malaria as a result of a wedding; or apoplexy, of a comet. If patients with half of each retina totally blind can walk the streets and do daily work for months oblivious of the defect until a collision with a street-car calls it to their attention, it is not hard to believe that slight, incipient lateral tract disease may escape notice until it produces sufficient awkwardness of movement to cause an accident.

The gradually developing maladroitness would be accentuated by weariness and thus increase the liability to mishap at such times. Furthermore, rest, such as is enforced for a period after the accident, would render the beginning motor defect less noticeable, while resumption of work after the immediate effects of the injury had disappeared would fix attention on the injured member and call into prominence its defect in power and dexterity. This accounts for a somewhat definite period that elapses between the trauma and the early symptoms supposed to result from it.

But after giving due weight to this reversal of causative relationship, and having subtracted all cases in which uncertainty remains, a certain number of cases lie before us in which no agency in producing the accident can be charged to the patient himself. The trauma acting on parturient women, the electric shock received by the boy, and the injuries received by the member first striking the ground, in patients who fell from buildings, cannot be charged to preexistent disease in the sufferers. Here we must conclude either that the trauma called forth the disease, or that the trauma preceded it merely as a chance antecedent. The attendant circumstances in some of the cases are such as to make the theory of chance improbable, though a much larger number of cases must be presented before it can be definitely eliminated.

The histories here presented admit, therefore, of one conclusion: A reasonable presumption exists, but no definite proof, that trauma is a proximate (evoking) cause of amyotrophic lateral sclerosis. If previously weakened cells and tracts exist in the spinal-cord, severe concussion or over-innervation (strain) can become the last straw that shatters the structure. Possibly congenital defect will some day be shown to be the ultimate cause (*causa sine qua non*) predisposing to the breakdown.

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SALVARSAN

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I. PREPARATION FOR INTRAVENOUS ADMINISTRATION

The cells of every living organism are adjusted to a certain osmotic tension and any variation of this tension in the fluids surrounding the cell injures it; therefore, the concentration of solutions of salvarsan injected intravenously is a matter of some importance. The practice seems to be to dissolve the salt in a variable amount of water and then to neutralize with sodium hydroxid, the exact osmotic tension of the resulting solution being a neglected factor. This is then brought up to a volume of 200 or 300 c.c. by adding, in some cases, physiologic salt solution, and in others distilled water. The statement is frequently made that 0.6 gm. of salvarsan neutralized and dissolved in 250 c.c. of distilled water approaches closely the osmotic tension of the fluids of the body. The fallacy of this can easily be shown.

We ordinarily accept a solution of sodium chlorid containing 9 gm. of the salt to one liter of distilled water as most nearly approaching physiologic osmotic pressure. The molecular weight of a given salt expressed in grams is said to be one "gram molecule." The molecular weight of sodium chlorid being 58.5, that amount of this salt, expressed in grams (58.5 gm.), dissolved in one liter of water is one "gram molecule," or, as suggested by Ostwald, 1 "mol." Any fraction of 58.5 gm. of sodium chlorid dissolved in a liter of water is that fraction of a mol. Consequently physiologic salt solution has an osmotic pressure of $9 \div 58.5$, or 0.15 mol. Thus we see that any solution intended for intravenous administration in order to be physically harmless must have a concentration of 0.15 mol.; the number of grams to the liter must be expressed by the formula, "0.15 $\times$ molecular weight of the dissolved salt."

Salvarsan as an acid salt ($HCl.NH_2.OH.C_6H_3.As:As.C_6H_3.OH.NH_2.HCl$) has a molecular weight of 421. For its complete neutralization with NaOH two HCl radicles are dropped and two atoms of Na are substituted for two atoms of H, thus giving a salt of less molecular weight—412. When a given amount of a salt with a molecular weight of 421 is changed to another salt with a molecular weight of 412, a proportionate loss in grams must at the same time take place. When 0.6 gm. of the acid salvarsan is used, 0.58 gm. of the sodium salt results. In this reaction, however, two molecules of NaCl are liberated. Using the above figures it can be seen that the amount of NaCl in this solution is 0.16 gm.

Supposing this reaction takes place in a liter of water, the osmotic tension of the resulting solution can be summed up as follows:

$$\text{For salvarsan } \frac{.58}{410} = .0014 \text{ mol.}$$

$$\text{For NaCl } \frac{.16}{58.5} = .0027 \text{ mol.}$$

$$.0041 \text{ mol.}$$

Knowing the molecular concentration of a given amount of these two salts dissolved in a liter of water to be .0041 mol., we compute the amount of water necessary to hold the same salts in a solution of 0.15 mol. (the osmotic tension required) as follows:

$$\frac{.0041}{.15} = .027 \times 1000 = 27 \text{ c.c.}$$

As isotonic solutions have the same freezing-point, this solution should theoretically freeze at 0.56, the freezing-point of the blood.

An ampulla of salvarsan was dissolved in distilled water, 4.4 c.c. normal sodium hydroxid added, and the resulting clear solution brought up with water to a volume of 27 c.c. The freezing-point of this was found to be 0.50. This variation from the theoretical can perhaps be partly explained by dissociation of the salt, and by the fact that, purposely, as is commonly the practice, the ampulla was not washed out to remove the small remaining powder adhering to it.

This error, however, becomes negligible when the volume is increased to 200 or 300 c.c. by the addition of an isotonic fluid such as physiologic salt solution.

Thus, the volume of a solution containing 0.6 gm. of salvarsan prepared for intravenous administration should approximate 25 to 35 c.c. in order to approach physiologic osmotic pressure. This considers only the physical, not the pharmacologic properties of the drug, and a consideration of the latter causes us to greatly increase the volume by the addition of an isotonic solution of some other salt.

II. THE IDENTITY OF THE WATER-SOLUBLE SODIUM SALT

It is commonly supposed that the following reactions take place in the preparation of salvarsan for intravenous administration:[1]

1. $HCl.NH_2.OH.C_6H_2.As:As.C_6H_2.OH.NH_2HCl + 2\ NaOH = NH_2.OH.C_6H_2.As:As.C_6H_2.OH.NH_2 + 2\ NaCl + 2\ H_2O.$

2A. $NH_2.OH.C_6H_2.As:As.C_6H_2ON.NH_2 + 2\ NaOH = NH_2.ONa.C_6H_2.As:As.C_6H_2.ONaNH_2 + 2\ H_2O.$

For 0.6 gm. of salvarsan in Formula 1, 0.114 gm. of NaOH would be required; that is, 2.8 c.c. normal sodium hydroxid solution.

To redissolve the salt, as expressed by Formula 2A, it is manifest that the same amount of sodium hydroxid would be required, using 5.6 c.c. for the entire process (1 and 2A). As a matter of fact, less is found to suffice.

Notwithstanding the known unstability of such a monosodium salt, it would appear that in place of 2A, the following occurs:

$H_2.As:As.C_6H_2OH.NH_2 + H_2O.$

2B. $NH_2.OH.C_6H_2.As:As.C_6H_2.OH.NH_2 + NaOH = NH_2.ONa.C_6$

Supposing that Formula 2B expresses the true reaction, one-half the amount of alkali used in Formula 1 would be required for this second reaction, i. e., 1.4 c.c. normal sodium hydroxid, or 4.2 c.c. in all. In practice 4.3 c.c. to 4.5 c.c. normal sodium hydroxid is actually used to precipitate the neutral and redissolve the sodium salt; which suggests the formation of a monosodium salt as in Formula 2B.

1. THE JOURNAL A. M. A., Dec. 31, 1910.

THE PRODUCTION OF ANTIBODIES TO PNEUMOCOCCI IN AN INSUSCEPTIBLE HOST *

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With the pneumococcus, as with most bacteria, the bulk of immunologic studies has been made with animals possessing a relatively high susceptibility to that organism. On the other hand, the general studies concerning the formation of antibodies have shown that specific antibody production is not directly dependent on any pathogenic value of the substance injected: Thus the precipitins to innocuous proteins; the agglutinins and hemolysins, to red blood-corpuscles; and, indeed, certain antitoxins themselves, namely, those resulting from toxoid injections, are all produced by the employment of antigens having no disease-producing power.

Starting from this point, I have tested the possibility of obtaining antibodies to pneumococci and their products, by the systematic inoculation of a relatively insusceptible animal with extreme doses of virulent pneumococci. The animal selected for this purpose was the common barn-yard fowl, birds in general being insusceptible to pneumococcus infection.

The pneumococci employed in the following experiments were from a human lung involved in acute lobar pneumonia. Throughout the period of immunization, the pneumococci were transferred each third day to fresh blood-agar (rabbit) slants. From time to time, the organism was passed through mice and rabbits, the virulence not being allowed to drop below the point at which a single inoculation of rabbits produced death. For convenience in obtaining large quantities for inoculation, the organism was grown on blood-agar slanted in flasks, the twenty-four hour growth equalling by count the number of organisms growing on twenty test-tube slants in the same time.[1] From the surface of each twenty-four-hour slant the organisms were washed by employing 5 c.c. of 0.85 per cent. sodium chlorid and the several suspensions were brought together immediately prior to inoculation. In all instances the growths were checked for contaminations. All inoculations were made intramuscularly into the breast, very slowly.

The following protocol gives the history of the inoculation of Fowl D, a white Leghorn rooster, weighing 2,000 gm.

INOCULATIONS OF FOWL D.

I. July 9, 1910: Received 60 c.c. emulsion of pneumococcus R'M'', containing twenty-four hour surface growth of twelve flasks (=240 tubes).

II. July 16: Received 60 c.c. emulsion from twelve flasks (=240 tubes).

III. July 17: Received 30 c.c. emulsion from six flasks (=120 tubes).

IV. July 26: Received 85 c.c. emulsion from seventeen flasks (=340 tubes).

V. August 23: Received 80 c.c. emulsion from sixteen flasks (=320 tubes).

VI. August 30: Received 80 c.c. emulsion from sixteen flasks (=320 tubes).

VII. September 11: Received 40 c.c. emulsion from eight flasks (=160 tubes).[2]

VIII. October 11: Received 90 c.c. emulsion from eighteen flasks (=360 tubes).

* From the Department of Pathology and Bacteriology, the University of Chicago.

1. Direct counts showed approximately 1,000,000,000 organisms in each such tube and 20,000,000,000 in each flask. These figures correspond closely to those for the streptococcus given by Weaver and Tunnicliff, Jour. Infect. Dis., 1908, v, 589.

2. Relatively small inoculation given because of marked progressive emaciation resulting from previous injections.

IX. November 12: Received 100 c.c. emulsion from twenty flasks (=400 tubes).

X. December 12: Received 100 c.c. emulsion from twenty flasks (=400 tubes).

XI. Jan. 15, 1911: Received 100 c.c. emulsion from 20 flasks (=400 tubes).

XII. February 3: Received 80 c.c. emulsion from fifteen flasks (=300 tubes).

As indicated above, Fowl D received twelve inoculations of pneumococci, the inoculations being distributed over a period of eight months, and representing 180 flask cultures (=3,600 tubes). Following each of the first two injections, there was a period of about twelve hours during which the animal was distinctly sick, and a similar but longer period (thirty-six hours) occurred immediately following the eighth injection. Throughout the immunization there was a progressive loss of weight. Other than for this, the animal appeared normal at all times.

February 20, or seventeen days subsequent to the final inoculation, the animal was bled to death, and the serum recovered for a series of tests as to its antibody content.

The bacteriolytic, agglutinating and bactericidal powers were tested as follows: An emulsion of the homologous strain of pneumococci was so made that each cubic centimeter represented the growth of two twenty-four hour blood-agar test-tube slants. One c.c. of the emulsion was added to each of five tubes of two series. To each of the tubes of one of the series, were added also decreasing amounts of normal fowl serum; to the tubes of the other series were added the corresponding amounts of the serum from Fowl D. The tubes were incubated at 39° C. for two hours, and then allowed to stand at 12° C. for eighteen hours. The readings given in Table 1 were made at the end of that period.

TABLE 1.—SHOWING RESULTS OF TESTS OF BLOOD-SERUM OF FOWL D FOR ITS BACTERIOLYTIC, AGGLUTINATING AND BACTERICIDAL POWERS, WITH CONTROL TESTS

1 c.c. of Serum Dilution Used.	(a) Serum of Normal Fowl.	(b) Serum of Fowl D.
1/5	Cloudy—no agglutination	Clear—no sediment.
1/25	Cloudy—no agglutination	Clear—agglutinated sediment.
1/50	Cloudy—no agglutination	Somewhat cloudy—sediment.
1/125	Cloudy—no agglutination	Cloudy — agglutination (?).
1/250	Cloudy—no agglutination	Cloudy—no agglutination.
Control without serum.	Cloudy—no agglutination	

Table 1 shows that Serum D, in contrast to the normal serum, produced distinct changes of the bacterial suspension. These changes are to be interpreted as caused by bacteriolysin and agglutinins. Immediately following the readings above recorded, the contents of each of the tubes of the two series was injected into a white mouse (15 gm.) to test the lethal action of the several mixtures. Table 2 gives the results of the inoculations.

TABLE 2.—RESULTS OF INOCULATIONS IN WHITE MICE WITH THE CONTENTS OF THE TUBES IN TABLE 1

Mouse Receiving Emulsion Containing Serum; Dilution Used.	(a) Normal Serum Series.	(b) Serum D Series.
1/5	† Within 36 hours.	Lived; no distress.
1/25	† Within 36 hours.	† Between 60 and 62 hours.
1/50	† Within 36 hours.	† Within 36 hours.
1/125	† Within 36 hours.	† Within 36 hours.
1/250	† Within 36 hours.	† Within 36 hours.
Control; emulsion containing no serum.	† Within 36 hours.	

In Table 2 and the following tables, the dagger (†) stands for "died."

Table 2 shows that in contrast to the normal fowl serum, the immune serum, when present in sufficient concentration, modified or destroyed the lethal action of the pneumococci for mice.

Following this demonstration of the action *in vitro* of the immune serum on pneumococci, tests were made as to its action *in vivo*. To standardize the dosage for these tests, preliminary experiments were made as follows: The twenty-four-hour growth of pneumococci from one blood-agar flask was suspended in 5 c.c. of salt solution and this suspension was tested in duplicate, as to its lethal action for mice (Table 3).

TABLE 3.—RESULTS OF INOCULATION OF MICE WITH PNEUMOCOCCUS EMULSION TO STANDARDIZE THE DOSAGE

1 c.c. Pneumococcus Emulsion; Strength.	Mice Weighing Approximately 15 Gm. (a) Series I.	(b) Series II.
Full	† After 36 hours.	† After 35 hours.
1/10	† After 35½ hours.	† After 36 hours.
1/50	† After 36 hours.	† After 38½ hours.
1/75	† After 39 hours.	† After 40 hours.
1/100	† After 46½ hours.	† After 47 hours.
1/150	† After 95 hours.	† After 104 hours.
1/300	Lived	Lived.
1/600	Lived	Lived.

These experiments indicated the approximate dosage for mice. The results showed that 1 c.c. of a 1/100 dilution of the suspension as prepared, served to kill mice within forty-eight hours; that the same amount of a 1/150 dilution killed only after four days; and that smaller doses were non-lethal. Further to test the forty-eight-hour lethal dose, however, a suspension similar to that used above was prepared from a second twenty-four-hour flask-culture of the same strain and this was tested on mice as follows: six mice were injected with 1 c.c. of a 1/100 dilution, and an equal number with 1 c.c. of a 1/150 dilution. All six mice receiving the 1/100 dilution died within forty hours, while all those receiving the 1/150 dilution survived three and one-half days or longer.

The above results showed that for the pneumococcus, as then growing, the forty-eight-hour lethal dose was approximately 1 c.c. of a 1/100 dilution of the standard suspension. On the basis of this dosage, the therapeutic value of the immune serum D was tested. This test was performed in triplicate, and consisted of two procedures. These procedures were, (1) the injection of the immune serum into mice coincidently with an inoculation with 100 times the forty-eight-hour lethal dose of pneumococci, and (2) the injection of the immune serum eighteen hours subsequent to the bacterial inoculation. All experiments in which there was an injection of the immune serum, were duplicated by controls in which normal fowl serum was substituted for the immune serum. In no instance did the normal serum display a protective action. The immune serum displayed a distinct protective action in all instances. Following is the protocol of the experiments:

Standard suspension of pneumococci was made as in previous experiments and employed undiluted in 1 c.c. doses, representing 100 times the forty-eight-hour lethal dose.

GROUP I (Control).—Each of two mice received 1 c.c. of the emulsion + 1 c.c. of salt solution, and each of two other mice received 1 c.c. of emulsion + 1 c.c. normal fowl serum; with results as shown in Table 4.

TABLE 4—RESULTS OF CONTROL INOCULATION OF MICE WITH PNEUMOCOCCUS SUSPENSION, NORMAL FOWL SERUM AND SALT SOLUTION

Mouse.	1 c.c. Pneumococcus Suspension + 1 c.c Normal Fowl Serum.
Red head	† In 20½ hours.
Red neck	† In 21 hours.
	1 c.c. Pneumococcus Suspension + 1 c.c. Salt Solution.
Red back	In 23½ hours.
Red tail	In 22⅔ hours.

GROUP II.—Coincidently with the above injections each of three mice received 1 c.c. of the suspension subcutaneously and at once 1 c.c. of immune serum D in same site. Three control mice received the same inoculation, but with normal serum in place of the immune serum. These controls all died within twenty-four hours. The mice receiving the immune serum survived as shown in Table 5.

TABLE 5.—RESULTS IN MICE RECEIVING 1 C.C. PNEUMOCOCCUS SUSPENSION AND AT ONCE 1 C.C. IMMUNE SERUM

Mouse.	Time After Inoculations. 10 Hrs.	23 Hrs.	42 Hrs.	67 Hrs.	3 Wks.
Red l. ear	Slightly sick	Normal.	Normal.	Normal.	Normal.
Red r. ear	Slightly sick	Normal.	Normal.	Normal.	Normal.
Red ears	Slightly sick	Normal.	Normal.	Normal.	Normal.

Three controls distinctly sick; all three †.

GROUP III.—Coincidently with the above inoculations, each of three mice received 1 c.c. of the pneumococcus suspension subcutaneously and eighteen hours later, when very sick, received the first of a series of subcutaneous injections of immune serum D, three control mice receiving normal fowl's serum. All died within twenty-four hours after inoculation. The course of the infection in the mice receiving the immune serum was as shown in Table 6.

The above experiments show that the immune serum D in contrast to normal fowl serum possessed a distinct protective power against the pneumococci inoculated. In those instances in which the serum was injected coincidently with the organisms, the protection was complete (Group II). In those instances (Group III) in which the serum was injected after the mice were definitely sick, the protection was marked; and in the one instance in which the serum treatment was pushed in an attempt to actually save the mouse, the protection was complete. It is to be noted that the length of survival of the mice of Group III was directly proportional to the amount of serum injected: The three controls without serum, died within twenty-four hours; the mouse receiving 1 c.c. of immune serum died after thirty-two hours; the mouse receiving 3.5 c.c. of serum died after two and two-thirds days; and finally, the mouse receiving 6 c.c. of serum recovered completely. In all, four of the six mice receiving the immune serum, were saved; and the life of the remaining two was lengthened. Equally striking was the temporary, but almost immediately beneficial, influence of each injection of the immune serum. It must be realized that the mice of Group III were practically moribund (within six hours of death, as indicated by the controls) when given the first injection of serum; within a short time, after the initial injection of the immune serum, however, they were apparently normal, running about the jar, and jumping away when touched. The same rapid recuperation occurred in the case of the two mice receiving the second injection of serum.

I am well aware that contentions have heretofore been made concerning an efficient serum producing immunity to the pneumococcus under experimental conditions. In general, however, the evidence has been inconclusive, in that the dose of organisms used in the inoculation has been relatively small, or the serum has been injected before the infection was definitely established, or that the host employed in the test was one of relatively slight sus-

TABLE 6.—MICE RECEIVING 1 C.C. PNEUMOCOCCUS SUSPENSION AND SUBSEQUENTLY IMMUNE SERUM

Mouse.	Time After Pneumococcus Inoculation. 18 Hours.	26 Hours.	30 Hours.	32 Hours.	44 Hours.	50 Hours.	64 Hours.	4 Days.	20 Days.
Red head and neck.	Very sick, flat on belly. Given 1 c.c. immune serum.	Running about jar and jumps when lifted. Possibly a little slow in movements, but otherwise normal.	Now somewhat sick. Has been growing less active.	† Received in all 1 c.c. serum.					
Red head and back.	Very sick and stiff; head tilted; flat on belly. Given 1 c.c. immune serum.	Same as mouse above; apparently normal.	Same as mouse above. Given 1.5 c.c. immune serum.	Again apparently normal; running about jar.	Seems somewhat sick; only fairly active. Given 1 c.c. immune serum.	Seems sick; flat on belly much of time and quiet.	† Received in all 3.5 c.c. serum.		
Red head and tail.	Very sick; flat on belly. Given 1 c.c. immune serum.	Same as mouse above; apparently normal.	Also has become sick again, as above mice. Given 2 c.c. immune serum.	Apparently normal; running about jar.	In very good condition, but possibly a little sick. Given 2 c.c. immune serum.	Not sick, but moving about jar; jumps when touched.	Not sick; is possibly a little sluggish, but seems normal and eats well. Given 1 c.c. immune serum.	Perfectly normal.	Has remained perfectly normal. Received in all 6 c.c. serum.
3 control mice.	All very sick. Given 1 c.c. normal serum.	All † within 24 hours.							

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ceptibility to the pneumococcus, and the possibility of spontaneous recovery, therefore, not eliminated. In the present instance it is to be emphasized that a very highly susceptible species was inoculated with 100 times the acutely lethal dose, and that in the therapeutic test the animals protected were prostrated with the infection prior to the first injection of serum.

My conclusions are that it is possible by inoculation of fowls with extreme doses of pneumococci to obtain a serum with specific antibodies and possessing distinct protective action against pneumococci within certain hosts.

Work now in progress, which is corroborative of the above results, will be reported at a later date.

THE THERAPEUTIC EFFECT OF HIGH NITRATES IN DRINKING-WATER *

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In the course of an examination of the waters brought to this laboratory some are occasionally found which are suspected by the owners of the wells to have peculiar properties, from the fact that they seem to produce diuretic effects on strangers using the water. In every case these suspicious waters have been found to be high in nitrates.

Formerly it was supposed that the organic substances held in solution in water had an injurious effect *per se*, but at the present time nitrates in a water in the absence of nitrites and considerable amounts of free ammonia are considered to indicate that the agents in nature that purify a water have done their work, and that all nitrogenous organic matter has been oxidized to a harmless condition, so that an unfavorable environment for pathogenic organisms has been set up. From the observations which follow it seems probable that this process of oxidation in water may be carried on to such an extent that the nitrates themselves may reach such quantities as to have a disagreeable effect, to say the least, on the system.

The authorities[1] state that the diuretic action of potassium nitrate and sodium nitrate is well known, and a special diuretic action has been attributed by many writers on therapeutics to the nitrate ion itself. In summing up this subject Sollmann says:

> The action is essentially a salt action. This appears to produce more specific irritation, which must be referred to the ion. The former is explained by its ready penetration and being foreign to the animal body; the latter is asserted on mucous membranes and results in gastritis at the place of entrance and in diuresis.

The dose prescribed by most writers is 0.30 gm., given as potassium nitrate in very dilute solution, an added action being affected by the potassium ion.

In well-waters which seem to have caused this marked diuretic effect, an excess of nitrate was found. The results of the examination of eight waters, the history of whose action was obtained at first hand, are given below.

TABLE 1.—EXAMINATION OF EIGHT WATERS FOR NITRATES

Specimen	Source	NO_3 equivalent to KNO_3 Gm. per liter
1	Tecumseh	0.288
2	LaCygne	0.346
3	Lawrence	0.433*
4	Lawrence	0.462*
5	Lawrence	0.382
6	Lawrence	0.361
7	Baldwin	0.346
8	Lawrence	0.505

* Complete analysis.

TABLE 2.—ANALYSES OF SPECIMENS 3 AND 4 *

Specimen 3		*Specimen 4*	
NaCl	0.0825	NaCl	0.2970
$NaNO_3$	0.3272	$NaNO_3$	0.2487
KNO_3	0.0438	KNO_3	0.1556
$NaHCO_3$		$NaHCO_3$	0.0978
$CaSO_4$	0.2813	$CaSO_4$	0.9301
$CaCO_3$	0.0916	$CaCO_3$	0.1167
$MgCO_3$	0.1031	$MgCO_3$	0.2157
SiO_2	0.0328	SiO_2	0.0178
Fe_2O_3 Al_2O_3	0.0036	Fe_2O_3 Al_2O_3	0.0042
Total solids	0.9659	Total solids	2.0826

*Results are expressed in grams per liter, and the constituents are calculated to the most probable combinations.

By a glance at the tables it will be seen that a person drinking one gallon of water a day, would, by a conservative estimate, receive approximately four doses of nitrate, and although the maximum diuretic effect might not be reached, it is possible that a marked irritation would be set up. It is true that the system might adjust itself to this continued irritation after a time, although in at least two of the cases in which this kind of water has been used for many years, the effect is still noticed.

Sample 1, Tecumseh, Kan.—In this case the patient always on returning home from a protracted stay noticed the very marked diuretic effect produced by the water.

Sample 2, La Cygne, Kan.—In this case the man after years of absence from home returned, and on taking up the drinking of this water noticed a marked diuretic action and at times gastritis.

Sample 3, Lawrence, Kan.—Four students attending the university had rooms where this water was used as the only source of drinking water. All noticed a marked diuretic action with almost constant irritation.

Sample 4, Lawrence, Kan.—An elderly woman who lived for two weeks at the place where this water was used, and alternately two weeks in the country, noticed that this water whenever she began to use it had a marked diuretic action, sufficient, in fact, to make it decidedly inconvenient. This woman's husband has also had kidney trouble for years.

Sample 5, Lawrence Kan.—A physician stated that he suspected that this water, taken from a well at his home, might be the cause of a continual desire to pass urine.

Sample 6, Lawrence, Kan.—Two young men rooming at this place complained that the water was causing a marked diuretic action.

Sample 7, Baldwin, Kan.—A farmer moving to the farm where this well was located, complained that his whole family had, since beginning the use of this water, been afflicted with "kidney trouble."

Sample 8, Lawrence, Kan.—A family of six persons who were continually using this water complained of the great inconvenience which it caused, on account of the difficulty experienced in retaining their urine. Two members of the family were afflicted with chronic kidney trouble. After an examination of the water was made, on the advice of their family physician, they were immediately placed on distilled water, and a marked improvement was shown within a very short time. One member of this family is afflicted with chronic gastritis. After the city water was used in the house the whole family soon reached a normal condition.

In this paper I have not attempted to claim definitely that the amount of nitrates present was the absolute cause for the physiologic conditions mentioned above.

* Read before the American Chemical Society, Kansas City Section.

1. Sollmann: Action of Nitrate Ion, Text-Book of Pharmacology, p. 565. Patten: Materia Medica—Diuretics, KNO_3; Butler: Materia Medica and Therapeutics—Diuretics, KNO_3; Cowperthwaite: Materia Medica, p. 385.

The evidence, however, seems to point very strongly to this conclusion. I very much hope that these facts will be brought to the attention of some one who has an opportunity for physiologic experiments on water-drinking, and that this may lead the way to experiments that will show definitely whether or not nitrates in water can reach a proportion sufficiently great to be in themselves harmful.

THE DIAGNOSTIC SIGNIFICANCE OF THE URINARY METHYLENE-BLUE REACTION WITH SPECIAL REFERENCE TO MALIGNANCY

PRELIMINARY REPORT

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In searching for the presence in the urine of abnormal products of elimination in cases of malignant disease, we observed that methylene-blue was decolorized by the urine taken from these patients. Repeated examinations and more extensive investigations demonstrated that urines in cases of rheumatism, nephritis, meningitis, etc., were also sometimes decolorized, but generally to a minor and variable degree. In most instances the latter conditions could be easily differentiated and eliminated, so that it appears as if this reaction may have considerable value in the diagnosis of malignant disease.

It is for this reason deemed justifiable, at this early stage, to make this brief preliminary report, so that other observers may investigate the value of this test by experimenting on a larger number of cases.

So far, this test has been positive in every well-established case of malignant disease. Many of these cases have been corroborated by operations and post-mortem and pathologic diagnosis. Though this test is not specific for malignant disease, occurring as it does with great constancy, particularly in pregnancy, also sometimes in nephritis, rheumatism, meningitis and in other conditions, it has proved already of considerable practical value in the diagnosis of malignant disease. As this test is extremely simple, and as no special apparatus or skill is required, it can be readily and quickly carried out by anybody anywhere. The decided and striking change of color leaves no doubt as to the presence or absence of the reaction.

TECHNIC OF TEST

Methylene-blue—we generally use 3 to 5 drops of Löffler's methylene-blue—is added to a test-tubeful of fresh urine; sufficient anilin dye is used to give it a decided blue color. The urine is shaken and then allowed to stand at room temperature for from twelve to twenty-four hours. A control fresh specimen of normal urine similarly treated is made. At the end of said time the blue color of the urine disappears; the upper layer, however, which is in contact with the air, still remains more or less blue. The control specimen, on the other hand, remains unchanged, retaining its uniform blue color.

More detailed investigations have already been instituted so as to further augment the scope of this test. For many tests made we have to thank the interns of the following hospitals: Dr. C. Breitman of the Brooklyn Jewish Hospital, Dr. W. Phipard of the Long Island College Hospital and Dr. C. R. Hutchins of St. Catherine's Hospital.

The accompanying table illustrates the above points.

URINARY METHYLENE-BLUE REACTIONS

No. of Cases.	Diagnoses.	Positive.	Negative.
34	Carcinoma (well established)	34	0
1	Sarcoma (well established)	1	0
5	Tumor (type unknown)	5	0
1	Fibroid?	0	1
1	Intraligamentous cyst	0	1
1	Hydatid cyst of liver	0	1
1	Small glandular swelling of breast	0	1
2	Hodgkin's disease	2	0
1	Banti's disease	0	1
23	Pregnancy (all cases in late stage)	22	1
1	Incomplete abortion	0	1
16	Post partum	6	10
3	Miscarriage	2	1
2	Complete abortion	0	2
2	Pyelitis of pregnancy	0	2
1	Post-partum sepsis	0	1
5	Nephrolithiasis	3	2
11	Nephritis	4	7
4	Hematogenous infection of kidney	3	1
3	Uremic coma and chronic nephritis	1	2
3	Chronic catarrhal gastritis	0	3
7	Gastric ulcer	0	7
2	Pyloric ulcer with induration	1	1
4	Duodenal ulcer	0	4
1	Intestinal ulcerations	0	1
1	Amebic dysentery	0	1
2	Enteroptosis with excessive peristalsis	0	2
1	Peritonitis	0	1
2	Chronic catarrhal colitis	0	2
2	Appendicitis	0	2
1	Catarrhal jaundice	0	1
11	Cholelithiasis	0	11
1	Acute cholecystitis	0	1
1	Chronic cholecystitis	0	1
1	Cholecystitis and mitral stenosis	0	1
4	Acute endocarditis	2	2
4	Pericarditis	0	4
3	Senility with arteriosclerosis	2	1
1	Acute bronchitis	0	1
17	Lobar pneumonia	1	16
3	Empyema	1	2
22	Articular rheumatism	1	21
1	Gonorrheal rheumatism	0	1
6	Typhoid fever	0	6
2	Brill's disease	1	1
2	Influenza	0	2
1	Pyemia	0	1
4	Diabetes (two with gangrene)	2	2
1	Gout	0	1
1	Encephalitis	1	0
5	Tuberculous meningitis	2	3
1	Anterior poliomyelitis	1	0
1	Temporal neuralgia with mitral stenosis	1	0
2	Acute salpingitis	0	2
1	*Bilharzia hæmatobia* (bladder)	0	1
1	Hernia	0	1
2	Hemorrhoids	1	1
5	Lacerated cervix and perineum	1	4
70	Various surgical conditions other than malignancy	0	70
19	Disease not determined	4	15
26	Normal urines	0	26
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In most cases other than those of malignancy in which the test was positive, it became negative usually in subsequent examinations, as the condition from which the patient was suffering improved.

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A CASE OF STRANGULATED HERNIA PRESENTING UNUSUAL SYMPTOMS

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Patient.—A Chinaman, aged 64, a laborer, for the past fifteen years had been troubled by a rupture which had gradually increased in size. On several occasions there had been difficulty in reducing the contents, but he had always finally succeeded. He had never used a truss. Four days previous to his admittance to the hospital, the swelling had increased in size and he had been unable to reduce it. He had suffered considerable pain. The bowels had moved once. According to the patient's statement, which was corroborated by that of his friends and relatives, he had not vomited at all.

Physical Examination.—The patient was a fairly well-nourished man; pulse was 120; temperature 101; respiration embarrassed. The abdomen was greatly distended and tympanitic. The right inguinal region showed a tense, tender swelling involving the right side of the scrotum. The skin over the swelling was reddened and edematous. There was no impulse on coughing. Rectal examination was negative.

Operation.—The usual incision disclosed a tense sac adherent to scrotum and containing a loop of gangrenous intestine, and the cavity of the sac filled with fluid feces. Gas and fecal material were seen to be escaping from two openings in the bowel. The sac was irrigated, the constriction relieved, and the gangrenous bowel wrapped in moist gauze. The loop of intestine was then brought well outside of the abdominal cavity and the distended bowel divided at a safe distance above the gangrenous area. This division allowed the escape of a large quantity of fluid feces and considerable gas. The gangrenous intestine 12 cm. in length was removed, together with a wedge-shaped piece of mesentery, and an end-to-end anastomosis effected with sutures. The spermatic cord was found to be flattened out by pressure and pulsation was absent in the vessels. The right testis was greenish-black in color and did not bleed on incision. Accordingly the cord was ligated off and removed together with the testis. The sac, very much thickened and adherent, was removed and the neck sutured at the internal ring. The closure of the inguinal canal was then effected in the usual manner. Drainage was provided for at the lowest end of the wound.

Except for a slight discharge from the drainage tract, the wound healed by primary union. The patient made an uneventful recovery and was discharged in three weeks in good general condition and with a firm wound.

COMMENTS

Vomiting has long been regarded as an essential symptom of intestinal obstruction caused by strangulated hernia and is so taught to students. A review of the literature at my disposal produces the following opinions: Vomiting at first of stomach contents and later of fecal material is evidently considered as an essential symptom in the following systems: Keen's "Surgery," "International Text-Book," "American Text-Book," Dennis' "System of Surgery," Von Bergmann's "System"; also in the surgical works of Ashhurst, Erichsen, Jacobson, Pick, Walsham, Tillmann, Spencer and Gask, and DaCosta. Sir James Paget in his "Clinical Lectures" says, "If I were asked which of the signs of strangulation I would most rely on as commanding the operation, I should certainly say the vomiting." The only exception made is by Treves who writes in his System, "Vomiting appears early, is a marked and *almost* constant symptom. . . ."

The gangrenous condition of the testis was evidently caused by pressure of the sac and contents on the spermatic cord. This must be a very unusual occurrence, as no mention is made of it in any of the above text-books.

HUGE HYDRONEPHROSIS (TWO GALLONS CAPACITY)

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CINCINNATI

Hydronephrosis is not an unusual lesion, and a distention of the pelvis of the kidney to a capacity of one or even two pints is perhaps not rare. A distention of the pelvis, however, to produce a cyst occupying the greater part of the abdominal cavity and containing more than two gallons of fluid is sufficiently unusual to justify a record of the case.

History.—Mrs. W., aged 68, gives a report of very good health previous to her present trouble, which began about twenty years ago. Her first symptom was a very peculiar sensation in the right leg, while walking, which extended from the thigh downward, and within half an hour she could not raise the foot from the floor. There was no pain elsewhere. One month later she had a second attack of sharp pain which commenced in the back on the right side and extended downward into the lower abdomen and into the thigh and leg in precisely the same manner as the first attack. There was very great nausea at this time, but no urinary symptoms. Similar attacks recurred until sixteen years ago, when she suffered from a severe attack of "gastric disturbance," which was characterized by very intense pain in the lumbar and right iliac region. Her physician diagnosticated her condition at the time as one of gas accumulation and obstruction. (It seems to me that a stone must have become lodged in the ureter at this time to cause a permanent total obstruction of the ureter.) The acute symptoms promptly subsided, but the swelling remained as a soft tumor mass in the right side of the abdomen. During the next several years the patient suffered frequently from stomach and liver attacks, as she designates them. The tumor remained about stationary in size during this period and could always be felt. Four years ago she had a very severe attack of abdominal trouble associated with gastric irritability and severe pain in the right side, particularly in the region of the liver. During the past four years the tumor has increased greatly in size and she had many attacks of pain. She has never suffered from bladder irritability, passes a normal amount of urine, and has never noticed anything abnormal in the appearance of the urine. Her main symptoms seems to be referable to the stomach. There have been no symptoms referable to the genitalia.

Physical Examination.—When seen for the first time on March 20, 1911, the patient appeared to be very well nourished and in fairly good health. The examination was negative, except for the abdomen, which showed a symmetrical enlargement equal to that of a seven or eight months' pregnancy. On palpation a distinct cystic tumor occupying the greater part of the abdominal cavity could be easily made out, but the right half of the abdomen and the right flank was distinctly more tensely filled out than the left. A fluid wave was easily determined. The middle of the abdomen—indeed the greater part of the abdomen—was flat on percussion and a tympanitic note was given on the left side and above the cyst. (No great importance was given before operation to the fact that a tympanitic note was not elicited on the right side because all other physical signs seemed to point so definitely to a large ovarian cyst.) Bimanual examination showed the uterus to be normal and the fluid wave was easily communicated from the tumor above to the examining finger below. A diagnosis of ovarian cyst was made.

Operation.—A midline incision below the umbilicus demonstrated at once that the cyst was not attached to either ovary and that it was retroperitoneal. The peritoneum was then divided over the cyst, and a large ovarian cyst trocar inserted to draw off the fluid. Two gallons of fluid were withdrawn and perhaps one pint remained in the cyst, which was not measured. The cyst was then delivered by a blunt dissection, which extended as far upward as the liver, without much hemorrhage. A large artery and a large vein were cut between clamps and later found to be the renal artery and vein. An examination now revealed no kidney on this side and a hurried examination demonstrated no special lesion in this ureter. The incision in the peritoneum was closed by continuous suture and abdomen closed without drainage. When the cyst was filled out with cotton the kidney could be easily demonstrated flattened out to a brown-paper thinness on one side of the cyst and the ureter, renal artery and vein could be seen.

This patient made a perfect recovery and is now entirely well.

108 East Auburn Avenue.

Aneurysm and Edema.—An aneurysm may compress and obstruct the flow of blood through one of the large veins and thereby produce edema.—J. B. Murfree, in *Southern Medical Journal.*

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SATURDAY, JUNE 24, 1911

SALICYLATES IN ACUTE ARTICULAR RHEUMATISM

That there is a prevailing tendency in medicine of late years to minimize the empirical use of drugs, and to rely more largely on intelligent aid to Nature by physical means, cannot be denied. But even the most ardent "therapeutic nihilist" as a rule acknowledges the value of certain drugs at times, and among these the salicylates as a remedy in acute articular rheumatism have occupied a prominent place. Recently, however, Menzer[1] has published an article, based on his experiences as a German army surgeon, which contradicts quite forcibly our prevalent conceptions on this subject. He does not dispute the fact that the judicious administration of salicylates may alleviate the symptoms to a marked degree, and so furnish relief to the sufferer and satisfaction to the physician. But in his experience, patients so treated were much more subject to recurrences, and in particular to deforming arthropathies, than were those handled without the use of salicylates. In all, he summarizes the results of his personal observation on 141 patients, of whom eighty-six were given the drug, and fifty-five treated without. Of the former group, eighteen, or 21 per cent., were incapacitated for further military service, and of the latter, four, or only 7 per cent. On the other hand, severe cardiac complications were about half again as frequent in the absence of salicylate treatment, pleuritis was almost four times as frequent, and the average length of treatment was increased from forty-six to seventy-four days. In addition to his own figures, Menzer cites those of several others, notably of Badt[2] (324 cases), which support to some extent his position.

Menzer's explanation for the greater frequency of recurrences and persisting deformities is as follows: Acute articular rheumatism, according to his conception, is the result of the localization on various serous surfaces of a generalized streptococcus infection, and the inflammatory processes giving the symptoms of the disease are curative reactions, and purely beneficial in character. The salicylates, he believes, act by producing a general vasodilatation, thereby relieving the local hyperemia and alleviating the suffering of the patient, but incidentally delaying the prompt absorption of the toxic products, and so increasing the liability of permanent damage.

The figures given by Menzer, and quoted above, would seem to indicate that such permanent damage does occur more frequently after the use of salicylates than without them. But neither the number of his cases, nor of those of Badt is sufficient to establish such a point beyond reasonable doubt; and it may be pointed out that Menzer found that cardiac and pleuritic complications were considerably more frequent when salicylates were not used, which by a style of reasoning similar to his might be interpreted as showing the beneficial action of the salicylates in preventing these complications—an action that is almost universally acknowledged not to exist. It is true that Menzer maintains that all the serous surfaces that may present inflammatory symptoms are already infected at the time of onset of the disease. But there is absolutely no way of proving or disproving such a contention.

The article serves to illustrate admirably a method of reasoning more frequently demonstrated on the converse proposition—the advocacy of new remedial agencies—than on the condemnation of old. *Post hoc, ergo propter hoc* has long been a stumbling-block to medical progress; and while it is quite possible that Menzer's assertions may be fully confirmed by farther observation, it would be as yet somewhat premature to discard agents as efficacious in affording relief as are the salicylates in rheumatism, on the strength of the evidence so far presented.

1. Menzer: Ztschr. f. Hyg. u. Infectionskr., 1911, lxviii, 206.
2. Badt: Vergleichende Statistik der Salizyl- und indifferenten Behandlung beim Gelenk-Rheumatismus: Diss., Berlin, 1883.

THE PRESENT STATUS OF ANTITYPHOID VACCINATION

The last report of the Surgeon-General of the Army adds more evidence to the already overwhelming testimony in favor of the protective value of antityphoid vaccination. The figures given for the fiscal year ending June 30, 1909, showed an incidence of typhoid fever sixteen times greater among the unvaccinated than among the vaccinated troops.[1] Up to Oct. 1, 1910, only five cases had developed among the immunized, as against 418 among the non-immunized. Moreover, of these five cases four were so mild as to leave doubt as to the diagnosis, and there were no bad effects of any kind as a result of the vaccination.[2]

The practice was introduced into our army in March, 1909, and although the taking of the treatment is entirely voluntary, over 17,000 officers and enlisted men had availed themselves of the opportunity to become immunized before the present mobilization of troops on the Mexican border.[3] Since that time the evidence concerning the procedure has been increasingly favorable. With the memory of Camp Chickamauga still fresh in our minds we are the better able to appreciate the great strides which have been made in preventive medicine

1. Annual Report, Surgeon-General, U. S. Army, 1910.
2. Keefer, F. R.: Mil. Surg., March, 1911.
3. Naval Med. Bull., April, 1911, p. 195.

since the days of the Spanish war. During that campaign there were 20,738 cases of typhoid with 1,580 deaths, and all within three and a half months. One man in every six had the disease and this was increased to one in every five among those regiments which were left in the United States.[4] Now, among the 18,000 men who have been mobilized on the southwest border for over two months, living under the usual camp conditions where rain and mud prevail, the only case of typhoid fever which has developed has been that of a single teamster who was unprotected by vaccination.[4] The results of vaccination practiced in the Army (12,000 cases up to Oct. 1, 1910) have been more fully described in THE JOURNAL by various army officers.[5]

Like most medical discoveries, the final perfection of the practice of antityphoid vaccination has resulted only after years of experimentation and apparent failures. To Prof. A. E. Wright of the British Army Medical School at Netley is due the honor of having first conceived and put in practice the idea of antityphoid vaccination.[6] This was before the Boer war. The results were rather unsatisfactory in South Africa during that campaign and it was only after further experimentation that the technic was finally perfected. One of the chief troubles had been in the fact that it had not yet been fully demonstrated that the best results were to be obtained only after the repetition of the process three times at intervals of ten days. The German army next took up the investigation and as a result the medical officials succeeded in cutting the typhoid fever rate in half by vaccination of a portion of the troops in Southwestern Africa in the campaign against the Hereros in 1904 and 1907. By this time the English were beginning to get better results, and in India, in 1908, among 12,000 soldiers stationed there, 6,000 were vaccinated, and 6,000 under similar conditions were left unvaccinated and maintained as controls. They found that seven times as many of the controls contracted typhoid and eleven times as many died of it.[2]

The trial has now been made long enough and with such uniformly good results that it is time the procedure should be seriously considered in civil life. A step has already been taken in this direction by the Public Health and Marine-Hospital Service. According to instructions recently issued, officers are required to practice antityphoid vaccination on all beneficiaries of the service who may desire it.[7] Speaking in general terms, these beneficiaries include all seamen or persons employed in any capacity on any licensed vessel of the United States except enlisted men in the Army and Navy. Sailors on both inland waters and the high seas are, from the roving nature of their calling, especially liable to exposure to typhoid infection. Thus they frequently become carriers of the disease and a menace to the general public. In view of these facts the recent action of the Public Health and Marine-Hospital Service should be regarded as a measure directly calculated to preserve the public health. It would seem as though the next logical move would be to place the antityphoid vaccine at the disposal of the civilian practitioner, as has been done already with the vaccine for the treatment of rabies.[8]

4. Address of President Taft, delivered to the Medical Club of Philadelphia, THE JOURNAL A. M. A., May 13, 1911, p. 1399; Current Comment, p. 1399.
5. Hartsock, Frederick M.: Antityphoid Vaccination; Result of 1,100 inoculations, THE JOURNAL A. M. A., June 25, 1910, p. 2133. Gosman, George H. R.: The Present Status of Antityphoid Inoculation, Ibid., Oct. 1, 1910, p. 1169. Foster, George B.: Antityphoid Vaccination; an Instance Illustrating Its Efficacy, Ibid., Nov. 19, 1910, p. 1808.
6. Smith, F.: Jour. Trop. Med., Sept. 1, 1904.
7. Pub. Health Rep., P. H. and M.-H. S., May 19, 1911.
8. Ann. Rep. Surgeon-General, P. H. and M.-H. S., 1910, p. 24.

EXPERIMENTAL MEASLES IN THE MONKEY

No recent experimental work has been reported on measles, but the almost universal prevalence and high mortality of the disease in the first two years of life on account of complications render any new facts regarding it of interest and importance.

Up to the present time, it has been believed that only human beings are susceptible to measles, and in recent text-books, the statement is made that attempts to transmit the disease to monkeys have never been successful, although Hektoen[1] has reported the successful inoculation of human beings with measles. Grünbaum experimented with chimpanzees but got apparently negative results.[2]

Anderson and Goldberger of the Public Health and Marine-Hospital Service, working in the Hygienic Laboratory, have just reported the successful transmission of measles from human patients to rhesus monkeys, and conclude that they have demonstrated the susceptibility of the rhesus monkey to inoculation with human measles through blood drawn from the general circulation early in the eruptive stage.[3]

A rhesus monkey inoculated by them April 28, 1911, had a slight rise of temperature on the tenth day after inoculation, and a sparse papular eruption which faded four days later, being accompanied by a fine branny scaling. This experiment was successfully repeated, other monkeys being used, and experiments were also made to test the immunity of a monkey that had previously been inoculated.

Not only have these workers succeeded in transmitting the infection from human beings to monkeys, but they also report the successful transmission of the infection from monkey to monkey.[4] The blood from each human patient was tested for sterility, as was also the monkey blood used for passage, and in no instance was a growth obtained. The transfers of the infection from monkey to monkey excluded the possibility of the symptoms observed being due to a toxin, and demonstrate that the symptoms noted were caused by a living virus. This

1. Hektoen, L.: Jour. Infect. Dis., 1905, ii, 256.
2. Grünbaum: Brit. Med. Jour., April 9, 1904.
3. Public Health Reports, June 9, 1911.
4. Public Health Reports, June 16, 1911.

work is another evidence of the rapid advances being made in investigations of contagious and infectious diseases generally, and while the reports referred to are only of a preliminary character, it is presumed that detailed reports will appear later and include the results of further experimental studies of the disease. In connection with this work on measles it is interesting to note that recent experiments by Cantacuzène[5] and Bernhardt,[6] and possibly also those by Hektoen and Weaver,[7] indicate that scarlet fever as well is transmissible to monkeys. Landsteiner and Levaditi[8] appear to have transmitted scarlet fever to chimpanzees. It would seem then that we are on the verge of advances in our knowledge as to the etiology and nature of these two diseases that so long have refused to yield up the secret of their causation.

THE INDEX

The index to the first volume of THE JOURNAL for 1911 will be found in this issue. Again we wish to call attention to a few of its valuable features. The index consists of three parts—the General Index, the Index to Current Medical Literature Subjects and the Index to Authors. In the General Index will be found all the matter, original and otherwise, including the abstracts, which appear in all of the various departments of THE JOURNAL (except ephemeral news matter), indexed by subjects and analytically, with numerous cross-references. In this department, also, will be found under the head of "Deaths" a list of the physicians who have died during this period, and under the head of "Book Notices" the titles of all books, with the names of their authors, which have been reviewed during the six months.

In the Index to Current Medical Literature will be found the titles of all articles appearing in nearly four hundred of the leading medical journals of the world; in this index also appear in a separate list the names of all authors of papers appearing in these various periodicals, as well as in THE JOURNAL.

This index is also bound in separate enlarged pamphlet form, called the "Guide to Current Medical Literature." It may be had from the Association office, either in single copies or by annual subscription. In this convenient form the physician or author desiring to look up the literature that has appeared during the previous six months has an almost complete index medicus of the literature relating to medicine. We urge our readers to give more attention to this index and to accustom themselves to depend on its aid. They will be surprised to find how completely it will fulfil their needs in looking up current literature.

5. Cantacuzène: Compt. rend. de la Soc. biol., 1911.
6. Bernhardt: Deutsch. med. Wchnschr., 1911, xxxvii, 791.
7. Hektoen, L., and Weaver, G. H.: THE JOURNAL A. M. A., June 17, 1911, p. 1795.
8. Landsteiner and Levaditi: Presse méd., May 3, 1911, p. 357.

Current Comment

THE INDEPENDENT PRESS

We have before us a news item from which we learn that Mrs. Murray of Roxbury, Mass., is asking $2,000 damages for the loss of her hair. About a year ago, so the newspaper says, the lady had auburn hair that reached to her waist; she used Birt's Head Wash and now has to wear a wig. We have before us, also, a large advertisement of Birt's Head Wash. These two facts considered individually would hardly be worth comment; the element of interest lies in their relation. The news item and the advertisement both appeared in the same issue of the newspaper—the Boston *Herald!* In these days when it is commonly reported that news is modified, softened or repressed to meet the real or supposed wishes of the big advertisers it seems worth while to call attention to what might otherwise be but uninteresting facts. Such episodes help to restore public confidence in the press; they also make for optimism and hopefulness. Verily, "the world do move."

THE DECLINING BIRTH-RATE IN RURAL NEW YORK STATE

Some rather unwelcome facts are brought to view by recent statistics[1] from New York state. During the month of March of the present year, there were altogether 18,693 births in an estimated population of 9,273,954. During the same period there were 14,227 deaths. It should be added, however, that during the month of March of this year, New York had the highest death-rate that it has had in a long time. The number of deaths for the month has never before been approximated in any month except March, 1904 and 1910, and even then not exceeded or even equaled. Of the births, 11,643 occurred in New York City, while there were only 8,353 deaths. In second-class cities from 50,000 to 175,000 inhabitants there were 1,104 births and only 847 deaths. In third-class cities down to 10,000 inhabitants there were 1,398 births and 1,237 deaths. As population becomes scantier, births and deaths approximate in number until in third-class cities (those under 10,000) the births and deaths are exactly equal, forty-five each. In the country places away from cities, however, there were 3,745 deaths and only 3,275 births. The reason for the more favorable balance of births and deaths in the cities is doubtless that the young people are moving into the cities rapidly, leaving the sterile older population in the country. Even taking into account this factor, however, it would appear that the number of births varies directly with the proportion of the foreign population. In New York City, where the foreign-born population is most numerous, the births exceeded the deaths by 4,617. In the other cities of the state the excess of births over deaths was only 313 for an estimated population of about a million and a half. In the country, however, where the native population is the largest and where there are the greatest opportunities for healthful living, in an estimated population

1. Bull. New York State Department of Health, April, 1911, New Series, vi, No. 4.

of nearly 2,500,000 there were actually 470 more deaths than births. Outside of New York City, in a population of about 4,500,000, there was a net loss of more than 150 in population during the month. While, of course, it would be rash to draw sweeping conclusions from the figures for a single month, these statistics certainly invite study of the problem thereby presented. The birth-rate, of course, must be studied over an extensive field and a considerable period of time, and in connection with many other factors, some of which cannot be found in statistical tables. Meanwhile, a safe deduction seems to be that we should give our attention most seriously to developing the attractions of rural life for young people.. A land where the rural population cannot hold its own, and the only increase is in the cities, comes very near being one "where wealth accumulates and men decay."

Observations on Low Blood-Pressures.—W. Edgecombe (*Proc. Roy. Soc. Med.*, March, 1911) has seen a number of patients suffering from no particular disease, but complaining of general slackness and want of tone, in whom the blood-pressure was abnormally low, the systolic reading being frequently below 100 mm. of mercury. In the majority of such cases there was no heart lesion discoverable, but the first sound at the apex was usually lacking in vigor; in others there were definite signs of dilatation. Improvement in the subjective sensations and objective physical signs almost always followed a rise in blood-pressure, and this led Edgecombe to seek for the most certain means of procuring this result. He therefore made a long series of observations, extending over two years, on a subject aged 40, normal in other respects, but with a persistently low blood-pressure, supplemented by serial observations on another subject and by routine observations on patients. Among the types of disorder in which he found low blood-pressures were subjects with cold hands and feet, with poor circulation, neurasthenia, tobacco poisoning, dilated heart, fibrositis, phosphaturia and arthritis deformans. Edgecombe made observations to find the effect on the blood-pressure of exercise, mental work, excitement and worry, altitude, constipation and various drugs, as aperients, alcohol, tea, caffein, tobacco, calcium chlorid and lactate, strychnin, digitalis, pituitary extract, glycogen, several proprietary preparations, including one of ergot and one from opium. He found three forms of baths that produced satisfactory results in raising the blood-pressure—the Vichy douche, the aerated Nauheim bath at temperatures on or below the indifferent point (90 F.) and the needle bath graduated from warm down to cool or cold. The Vichy douche consists of a needle douche projected downward on the patient throughout the duration of the bath while massage is administered to the whole body by attendants. After about twenty minutes' rubbing a separate needle douche is given in the erect posture and the bath terminates. The immediate effect is a rise of from 10 to 15 mm. pressure, and after a series of baths the rise in pressure becomes permanent. These measures, together with diet, exercise, change of air, etc., are to be preferred to drug treatment. As to diet, an excess of meats should be prescribed, with a corresponding diminution of the starchy elements. If drugs are required pituitary extract has the most powerful and rapid effect. Edgecombe has had no experience in giving it over long periods of time and would hesitate to continue such a powerful drug. Next in potency would be caffein, given only if the patient were not an excessive tea or coffee drinker. Calcium lactate appears to be only moderately effective; strychnin is disappointing; digitalis should be reserved for cardiac cases. The other drugs experimented with are apparently of little value.

Medical News

COLORADO

New Building for Hospital.—St. Joseph's Hospital, Denver, announces that it is about to erect a new building with capacity for fifty patients.

Nurses' Association Opens Day Camp.—The Visiting Nurses' Association of Denver has opened a day camp for babies on the grounds of the Bryant school. The undertaking is financed by the *Rocky Mountain News*.

Boulder Offers Sanatorium Site.—The city of Boulder has offered a 40-acre site for the national sanatorium for consumptives contemplated by the Foresters of America. The sanatorium, as planned, will cost $250,000.

ILLINOIS

Isolation Hospital for Sheridan.—Contract has been awarded for the erection of an isolation hospital at Fort Sheridan, to cost $21,000.

Memorial to Dr. Craig.—Members of the Rock Island County Medical Society honored the memory of the late Dr. George Gorgas Craig of that city, June 13, by holding a memorial meeting at the Manufacturers' Hotel, Moline. The program of the evening was in charge of a committee consisting of Drs. E. M. Sala, Carl Bernhardi and Joseph De Silva.

Personal.—Dr. and Mrs. Merritt C. Bragden, Evanston, have started for Europe.——Dr. George Steely has been transferred to the surgical staff of St. Elizabeth's Hospital, Danville; Dr. Raymond L. Hatfield has been appointed a member of the surgical staff, and Dr. Fred A. Baumgart has been made a member of the medical staff of the hospital.——Dr. Clinton Helm, Rockford, who is more than 80 years of age, saved his granddaughter from drowning in Rock River, June 2, diving for the body and resuscitating her after he brought her to shore.——Dr. Lee Smith, Bloomington, a member of the McLean County Medical Society for fifty-six years, has been appointed a life member.

Chicago

Class Reunion.—The class of 1899 of Rush Medical College held its annual reunion and dinner at the Bismarck Garden, June 15. Dr. William D. Byrne, the president, and Dr. John D. Ellis, the secretary, announce that they will be glad to hear from out-of-town members of the class who may be visiting Chicago.

Personal.—Dr. George E. Shambaugh, secretary of the Section on Laryngology, Otology and Rhinology, who has been ill with typhoid fever for three weeks, is reported to be improving, but he will not be able to go to the Los Angeles Session.——Dr. Thomas J. O'Malley was cut by broken glass in the hands and arms, June 13, when a runaway team ran into the platform of a car on which he was riding.

Memorial to Dr. Hyde.—Memorial services in honor of the late Dr. James Nevins Hyde were held at Rush Medical College, June 12, and a tablet presented by the alumni of the institution, and commemorating the work of Dr. Hyde, was unveiled. Charles Cheney Hyde made the presentation speech on behalf of the alumni, and the gift was accepted in the name of the student body by the dean, Dr. Frank Billings. Dr. James B. Herrick delivered the memorial address.

Diarrheal Diseases.—The health department, in its *Bulletin*, requests the cooperation of the medical profession and the hospitals of Chicago in the matter of reporting statistics of diarrheal diseases which come to their notice. The application of effective measures for prevention must be guided by statistical data which can be obtained only through this cooperation. Unless specially requested, it is not the purpose of the department to visit a patient under a physician's care, but, if the physician indicates that inspection should be made of the surrounding sanitary conditions of the foodstuffs, including milk furnished the family, the department will give immediate attention to the situation. Postal cards for these reports will be furnished free to physicians and hospitals.

INDIANA

Tent Colony for Terre Haute.—The tuberculosis committee of the Terre Haute Society of Organizing Charity has opened a tuberculosis colony on the Deming Camp, southwest of the city and on the river. Several shacks are now on the site and other shacks will be erected to accommodate the patients.

Personal.—Dr. Tilman O. Armfield, Ellwood, asks for information regarding his son Jesse T. Armfield, sometimes known as "Jack" Armfield, who is reported to be in the northwestern states and is most likely located on a claim or ranch or at a

mill or lumber plant. He suggests that some of his friends who go to Los Angeles might perhaps learn something of the lad while in the West.——Dr. James V. Nelson, Logansport, has been appointed coroner of Cass County.——Dr. Charles Rea, Falmouth, who was recently operated on for the removal of gall-stones at the Sexton Sanitarium, Rushville, is much improved.——Dr. Calvin W. Burket, Warsaw, sustained painful injuries in a fall down stairs, June 7.——Dr. Leida Powers Leasure, Auburn, has been appointed superintendent of schools of De Kalb County.——Dr. T. Victor Keene has qualified as a member of the Indianapolis Board of Health.——A verdict of $5,000 has been given Dr. Ernest E. Wishard, Noblesville, in his suit for damages against the Central Indiana Railroad Company.

KENTUCKY

Personal.—Dr. J. T. Wallingford, health officer of Covington, is reported to be seriously ill with rheumatism, and Dr. Cleon C. Owens is temporarily in charge of the department. ——Dr. William M. Dwyer, Louisville, was struck by a street car while driving recently, and suffered a dislocation of his right arm.

Equipment of Sanatorium.—Provided there are no legal obstacles in the way, the Louisville Hospital Commission will appropriate $25,000 for use in equipping Waverly Hill Sanatorium for the treatment of all tuberculosis patients. In order to convert the present buildings into a permanent institution, it is estimated that $27,600 will be required, and it is planned to build four additional wards, each to accommodate sixteen patients. Work will be begun in a few days on the building selected by the commission for use as a temporary city hospital.

LOUISIANA

Health Exhibit Train to Los Angeles.—The Health Exhibit Train of the Louisiana State Board of Health is to be taken to California to be exhibited at the meeting of the American Medical Association, Los Angeles. The train will go via El Paso and will return via Ogden, Omaha and Chicago.

New Parish Society.—The physicians of West Carroll met in Pioneer recently and organized a parish medical society, electing Dr. Thomas N. Pulley, Floyd, president; Dr. Charles W. Smith, Oak Grove, vice-president; Dr. I. R. Fowler, secretary and treasurer, and Dr. John J. Flake, Pioneer, delegate to the state medical society.

Seeking Leprosy Serum at Tulane.—At a recent lecture Dr. Charles W. Duval, professor of pathology at Tulane University, described the experiments that he and his assistants had been making in leprosy and spoke of the preparation of a serum, which, it was hoped, might prove beneficial in the disease as it has already proved successful in test cases.

The Picayune Cup Presented.—The *Picayune* loving cup, given to Dr. Sarah Tew Mayo because of her splendid activities in behalf of the Woman's Dispensary, New Orleans, was presented May 26, in the presence of members of the Progressive Union, the Orleans Parish Medical Society, various women's clubs, etc. The presentation was made by Mr. M. J. Saunders.

Councilors of State Society.—The Louisiana State Medical Society, at its thirty-second annual meeting, elected, in addition to the officers mentioned in THE JOURNAL of June 10, the following councilors: First district, Dr. Paul E. Archinard, New Orleans; second district, Dr. Hermann B. Gessner, New Orleans; third district, Dr. Henri L. Ducrocq, La Fayette; fourth district, Dr. Randall Hunt, Shreveport; fifth district, Dr. Isaac J. Newton, Monroe; sixth district, Dr. Louis G. Stirling, Baton Rouge, and seventh district, Dr. Ladis Lazaro, Washington. Dr. Clarence J. Edwards, Abbeville, is the new chairman of the House of Delegates, and Dr. Laurence R. DeBuys, New Orleans, was reelected secretary. The House recommended to the governor the names of Drs. Homer Du-Puy or Edward L. McGehee, New Orleans, for appointment to the State Board of Medical Examiners.

MAINE

State Society Meeting.—The Maine Medical Association will hold its annual meeting in Augusta, June 28-30.

Subscription for Children's Hospital.—The Children's Hospital, Portland, has raised by popular subscription more than $25,000 for maintenance expenses.

Personal.—Dr. William L. Cousins, Portland, has sailed for Europe.——Dr. and Mrs. Gustav A. Pudor leave for Germany next month.——Dr. Alfred Mitchell has resigned from the faculty of the Medical School of Maine, after forty-two years' service, and Dr. Frederic Henry Gerrish has resigned from the chair of surgery after a service of twenty-nine years.——Major Bial B. Bradbury, M. C. N. G., Me., Norway, has been relieved from duty with the coast artillery and assigned to the second infantry.——Captain Charles L. Cragin, M. C. N. G., Me., Portland, has been promoted to major and Lieutenants Harry W. Sampson and William L. Haskell, M. R. C., Me., have been commissioned first lieutenants in the medical corps of the state. ——Dr. James B. Cochrane, Dover, has been appointed a member of the local board of health.

MARYLAND

Bequests.—By the will of the late Dr. Charles M. Ellis, Elkton, $18,000 is bequeathed to the Medical and Chirurgical Faculty of Maryland and $5,000 to the Union Hospital of Cecil County.

Baltimore

Emergency Ward.—The Methodist Hospital Association, which is now in charge of the Maryland General Hospital, will establish on the first floor a ward for accidents and emergencies.

College to Move.—It is announced that the Maryland Medical College will be moved to buildings which it owns adjoining the Franklin Square Hospital, and that the old college building on Park Street will be sold.

MISSOURI

Compulsory Vaccination.—Beginning with next September, by order of the board of curators, all students in the University of Missouri, Columbia, will be required to be vaccinated.

Home for Physicians Planned.—At the recent meeting of the Missouri State Medical Association, the president, Dr. Herman E. Pearse, Kansas City, recommended that a committee be appointed to consider plans for either a home or pensions for indigent, infirm and aged physicians, and their wives or widows.

Southwest Missouri Physicians Meet.—The annual meeting of the Southwest Missouri Medical Association was held in Springfield, May 25-26, and the following officers were elected: president, Dr. Oscar N. Carter, Republic; vice-presidents, Drs. Francis S. Stevenson, Aurora, and Theodore A. Coffelt, Springfield; secretary, Dr. Herbert S. Hill, Springfield, and treasurer, Dr. Lee Cox, Springfield.

Ambulance Surgeons in Kansas City.—At a joint meeting of the police commissioners of Kansas City with the members of the hospital and health board, it was agreed that Dr. Eugene Carbaugh, Kansas City, the new police surgeon, is to have no authority whatever over the surgeons attached to the automobile ambulances. It was also agreed that these surgeons shall be called, not police surgeons, but ambulance surgeons.

NEW JERSEY

Personal.—Dr. Berthold S. Pollack, medical director of the Hudson County Tuberculosis Sanatorium, Snake Hill, has been reappointed for a term of five years.——Dr. Gordon K. Dickinson, Jersey City, visiting surgeon to the city hospital, has been given leave of absence and is going abroad. Dr. Charles H. Finke, Jersey City, has been promoted from assistant visiting physician to visiting physician.——Dr. Robert R. Armstrong, Passaic, sustained a fracture of the right arm in a collision between his automobile and a wagon, May 31.——Dr. Stewart Maul, intern in the Atlantic City Hospital, has resigned.

Society Meetings.—At the annual meeting of the Salem County Medical Society, held in Salem, Dr. Henry Jackson, Salem, was elected president; Dr. Frank B. Husted, Quinton, vice-president; Dr. Henry Chavanne, Salem, secretary and treasurer; Dr. John F. Smith, Salem, reporter, and Dr. Wm. H. James, Pennsville, censor.——Hunterdon County Medical Society has elected the following officers: president, Dr. Isadore Topkins, Califon; vice-presidents, Drs. Henry H. Miller and Samuel B. English, Glen Gardner; secretary, Dr. Obadiah H. Sproul, Flemington, and treasurer, Dr. Edw. W. Closson, Lambertville.——Camden County Medical Society at its annual meeting held in Camden, April 25, elected Dr. Aahab Haines Lippincott, Camden, president; Dr. John K. Bennett, Gloucester City, vice-president; Dr. Daniel Strock, Camden, secretary; Dr. Alexander S. Ross, Camden, assistant secretary. ——A meeting was held, May 12, in the lecture room of the Newark Free Public Library, under the auspices of the New Jersey State Pediatric Society. The evening was devoted to a symposium on the "Hygiene of Childhood" which was divided into the hygiene of development, environment and school life, and prophylactic hygiene.——At the annual meeting of Sussex County Medical Society, held in Newton, May

10, Dr. Albert N. Jacobs, Sparta, was elected president; Dr. Edward A. Ayers, New York City, vice-president; Dr. Frederick P. Wilbur, Franklin, secretary; Dr. Ephraim Morrison, Newton, treasurer, and Dr. Harvey D. Van Gassbeek, Sussex, reporter.——Bayonne Medical Society at its annual meeting elected Dr. Ernest Thum, president; Dr. J. Stucky Smith, vice-president, and Dr. Frank, secretary-treasurer.——The Society for the Relief of Widows and Orphans of Medical Men of New Jersey, at its annual meeting held in Newark, elected the following officers: president, Dr. Archibald Mercer; vice-president, Dr. Edward J. Ill; secretary, Dr. Charles D. Bennett, and treasurer, Dr. Harold A. Tarbell, all of Newark.——The Physicians' and Surgeons' Club of Jersey City held its sighth anniversary meeting in New York City June 6. Dr. Daniel B. Street was elected president; Dr. John M. B. Wainwright, vice-president, and Dr. James G. Enright, secretary and treasurer.

NEW YORK

Alumni Meeting.—The annual meeting of the Alumni Association of the medical department of the University of Buffalo was held May 30 and the following officers were elected: president, Dr. Charles L. Preisch, Lockport; vice presidents, Drs. Nellie V. Chappell, Buffalo; Eugene B. Horton, Niagara Falls; Edgar A. Forsyth, Buffalo; Jacob E. K. Morris, Olean, and Benjamin F. Rogers, Buffalo; secretary, Dr. Descum C. McKenney, Buffalo; treasurer, Dr. William F. Jacobs, Buffalo, and trustee, Dr. Marshall Clinton, Buffalo.

New York City

Cornell Commencement.—The thirteenth annual commencement of Cornell University Medical College was held at the college, June 14.

Epidemic Diseases on Steamer.—On the arrival of the steamer *Carpathia* at quarantine, June 6, fifty cases of measles were reported on board, and the passengers were detained at quarantine until those affected had been transferred to Hoffman Island.——*La Bretagne* from Havre was detained at quarantine several hours June 7 on account of a case of small-pox on board.——The Italian steamship *Europa*, which arrived from Genoa and Naples June 14, reported that a steerage passenger was suffering from cholera, and the steamer, with its passengers, was detained at quarantine.

Infants' Milk Station.—The health commission announced on June 6 the formation of an association of infants' milk stations of the borough of Manhattan, consisting of all the agencies engaged in this particular work. The objects of the association are to avoid duplication of effort and overlapping of territory, to establish an identical system of records, to provide full cooperation of existing forces, and educational publicity, and to gain the fullest efficiency in results. Dr. Sara J. Baker, director of child hygiene of the department of health, has been elected chairman of the association and the following have been selected as members of the executive committee: New York Milk Committee, Mr. Paul E. Taylor; New York Diet Kitchen Association, Miss M. L. Daniels; Nathan Strauss Laboratories, Dr. Arthur R. Green; Nurses' Settlement, Miss Lillian Wald; Babies' Dairies, Dr. Renel A. Benson, and Morningside Milk Dispensary, Mr. Allen McCurdy. At present there are sixty-five stations in the borough of Manhattan and this number will, probably, be increased during the summer. In practically all of them nurses are in attendance every day to instruct the mothers in the proper modification and care of milk, and physicians hold conferences at stated intervals during the week, at which the mothers are given general instruction as to the care of babies, and sick babies are treated.

NORTH CAROLINA

Society Meeting.—At the annual meeting of the Rockingham Medical Society, held in Wentworth, May 26, the following officers were elected: president, Dr. Thomas G. Taylor, Leaksville; vice-president, Dr. Andrew F. Tuttle, Spray; secretary and treasurer, Dr. John W. McGehee, Reidsville; delegates to the state association, Drs. Charles R. Wharton, Ruffin, and R. C. Matheson, Madison, and alternates, Drs. Samuel G. Jett, Reidsville, and Samuel Ellington, Wentworth.

New Hospitals.—Drs. James K. Hall and Paul V. Anderson, physicians on the resident staff of the State Hospital for the Insane, Morganton, N. C., with Dr. E. M. Gayle of Burna Brae Sanatorium, Philadelphia, have purchased the Westbrook Place near Richmond, Va., and will open it as a hospital for the treatment of mild cases of insanity and drug habits about September 1, 1911.——The Forsyth County Medical Society is said to contemplate erecting a hospital at Winston-Salem, to cost from $75,000 to $100,000.

NORTH DAKOTA

Personal.—In honor of Dr. Archibald L. McDonald, instructor in the College of Medicine, Grand Forks, for the last seven years, who is about to sever his connection with the institution, a banquet was given by the Gamma Phi fraternity recently.——Dr. Homer A. Smith has succeeded Dr. George A. Carpenter as health officer of Fargo.——Dr. Albert M. Fisher, Bismarck, sailed for Europe, May 19.——Dr. Fred A. Bordwell, Marmarth, sustained severe injuries to the spine in a runaway accident recently.——Dr. and Mrs. Charles L. Chambers, Bismarck, have returned from Europe.

PENNSYLVANIA

Statue to Physician Unveiled.—A bronze statue of Dr. Traill Green, Easton, first president of the American Academy of Medicine, was unveiled May 30. The statue was erected by the Eastern Cemetery Company, of which Dr. Green was first president, as a tribute to his memory, his great service to the association, to science, education, medicine and Christianity. The statue is designed by an Easton sculptor, Harry Lewis Raul.

State Milk Law.—By the terms of the Piper Pure Milk bill, approved by the governor June 8, the state is given the same standards for milk as those of the United States Government. The bill prohibits watering of milk, and provides that no substance may be added to increase its consistency, but allows the sale of skimmed milk under that name. The standard for milk is fixed at 3¼ per cent. butter fats and 12 per cent. solids, and for cream 18 per cent. butter fats, with the proviso that cream which is treated, condensed or evaporated may be sold as such if so labeled. The penalty for violation is a fine between $25 and $50, or imprisonment from 30 to 90 days, either or both. The Dairy and Food Commissioner is charged with the enforcement of the act.

Philadelphia

Free Lunches Beneficial.—The luncheon committee of the Home and School League completed on June 9 its experiment, which had been carried on for ten weeks with fifty children of the Woods School for the purpose of proving that the 3-cent lunch was beneficial as well as economical. Tests show that the children have gained in weight, that their hand grip has increased from 50 to 100 per cent. and that they have gained in lung capacity from 20 to 40 per cent.

Typhoid at State Institution.—For over two months the Health Department of this city and the state health authorities have been working to locate the source of typhoid contagion in the Pennsylvania Institute for the Deaf and Dumb, Mount Airy. Two new cases have just been reported, making a total of thirty cases and two deaths during the last two months. Tests have been made of the milk supply, butter and other foods, also a careful examination of the inmates and attendants to learn if there were typhoid carriers among them, but all without result.

Pure Food Crusade.—It has been announced by the agent of the State Dairy and Food Commission, that exposure of meat, chickens, cakes and other foodstuffs of like character to contamination from flies and dust will be followed by prosecution of the dealers under the pure food laws of Pennsylvania.——On June 6, warrants for over a dozen bakers, charged by Harry P. Cassidy, special agent of the commission, with using coal-tar dyes and bad eggs in their cakes and pies, were served by constables from Magistrate Beaton's office. A chemical analysis of the pastry sold by these bakers was made by Professor LaWall and in one pie enough yellow dye was found to stain a yard of cotton cloth.

Catholic Physicians' Guild.—The Roman Catholic Physicians of Philadelphia have organized a branch of the Guild of St. Luke, St. Cosmos and St. Damian. The first meeting was held May 26, in the hall of the American Catholic Historical Society and the following temporary officers were chosen: president, Dr. Lawrence F. Flick; vice-president, Dr. Ernest La Place; secretary, Dr. William T. Dempsey, and treasurer, Dr. Austin O'Malley. The aim of the guild is to facilitate intercourse between Catholic members of the medical profession for the discussion of medical questions relating to philosophy, morals, ethics, theology, histology and law, and the upholding of the principles of Catholic morality as against an unscientific materialism.

TENNESSEE

Medical Department Moves.—It was announced June 1, that the Vanderbilt medical and dental departments would be transferred to the old Peabody College grounds at the beginning of the next session.

Donation Toward Hospital.—It is reported that Mr. Andrew Carnegie has agreed to give $10,000 toward the completion of the new Hubbard Hospital of the Meharry Medical College, Nashville, Tenn., on condition that the college secures $10,000 additional. The work of raising this amount has already commenced.

Hospital Staff Named.—At a meeting of the Nashville City Hospital Commission, June 7, the following hospital staff was named: general surgeon, Dr. Frank P. Head; obstetrics, Dr. McPheeters Glasgow; medicine, Dr. C. Bailey Bell; genito-urinary diseases, Dr. William F. Glenn; diseases of the eye, ear, nose and throat, Dr. Marvin M. Cullom, and abdominal surgery and gynecology, Dr. Rufus E. Fort.

VIRGINIA

Epileptic Colony Opened.—The new State Epileptic Colony in Amherst County, opposite Lynchburg, has been formally opened. Ninety patients have been admitted and there is still room for ten more.

Hospital Chartered.—Grace Hospital corporation, Richmond, has been chartered with a minimum capital stock of $50,000 and ground has been broken for the building at Grace and Monroe streets. Dr. Robert C. Bryan is president of the company and Dr. H. Stuart McLean, secretary and treasurer.

Medical College Elects Officers.—At the annual meeting of the faculty of the Medical College of Virginia, Richmond, June 3, all the officers were unanimously reelected, with the exception of Dr. J. McCaw Tompkins, librarian, who was made professor of diseases of children, vice Dr. Charles A. Blanton. Among the changes in the adjunct faculty are the promotion of Dr. St. George T. Grinnan, from senior lecturer on pediatrics to chief of clinics in the practice of medicine, and the succession of Dr. Douglas Vanderhoof to Dr. Grinnan as senior lecturer on pediatrics.

Child Welfare Conference.—A child welfare conference was held at Richmond, May 22-25, under the auspices of the State Conference of Charities and Correction, and presided over by Dr. R. K. Flannagan, Charlotteville. The work of the conference was taken up under the three general heads of philanthropy, education and health and civics. The main topics of discussion were "Infant Mortality," "The Normal Child," "Education," "The Dependent and Neglected Child," "The Need of Vocational Training for Girls," "The Dependent Child in Placing-Out Work," "The Delinquent Child," "Instruction of Children in Sex Hygiene," "Cooperation and Education."

WASHINGTON

Hospital Note.—Dr. Hiram M. Johnson, mayor of Toppenish, has disposed of his interest in the Toppenish Hospital.

Personal.—Dr. Edward R. Northrup, Spokane, is convalescent after a surgical operation.——Dr. Mary A. Latham is critically ill at the home of her son in Spokane.——Dr. James H. McDonald, Puyallup, is recovering after an operation performed at the Fannie Paddock Hospital, Tacoma, recently.

WEST VIRGINIA

Antituberculosis Work.—The members of the Ohio County Antituberculosis League have received $6,000 in pledges toward the erection of a sanatorium for tuberculosis.

College of Medicine Closed.—The 1910-11 catalogue of the West Virginia University contains the statement that the college of medicine of that institution has been discontinued.

WISCONSIN

Tuberculosis Commission.—The mayor of Milwaukee has appointed a commission to decide on preventive and relief measures against tuberculosis. The commission includes H. A. Wagner, Miss Katherine R. Williams, Drs. Hoyt E. Dearholt and Alfred N. Baer, and Mrs. Thomas Spence.

State Society Meeting.—The sixty-fifth annual meeting of the Wisconsin State Medical Society was held in Waukesha June 7-9, and the following officers were elected: president, Dr. John M. Dodd, Ashland; vice-presidents, Drs. Theodore J. Redelings, Marinette; Charles A. Armstrong, Boscobel, and Hoyt E. Dearholt, Milwaukee; secretary, Dr. Charles S. Sheldon, Madison (reelected); assistant secretary, Dr. L. Rock Sleyster, Waupun (reelected), and treasurer, Dr. Sidney S. Hall, Ripon. The next meeting of the society will be held in Wausau.

GENERAL NEWS

Personal.—Jefferson Medical College conferred on Dr. Victor G. Heiser of the Philippines, the degree of doctor of science, at the recent commencement exercises.

Railroad Hospital System Planned.—The Illinois Central Railroad and its allied lines announced that the Illinois Central Hospital department will be inaugurated July 1. The proposition is to build up the hospital system, slowly, on an extensive basis until it has reached such proportions as to make it possible to establish division hospitals along the lines of the roads interested, with the entire medical staff under the control of the chief surgeon of the road.

Genito-Urinary Surgeons Hold General Meeting.—At the twenty-fifth annual meeting of the American Association of Genito-Urinary Surgeons, held in New York City, May 31-June 3, Philadelphia was selected as the next place of meeting and the following officers were elected: president, Dr. Edward Martin, Philadelphia; vice-president, Dr. Edward L. Keyes, Jr., New York City; secretary and treasurer, Dr. J. Bentley Squier, New York City, and councilors, Drs. Charles L. Gibson and Robert H. Greene, New York City.

Albany Alumni Meet.—The thirteenth annual meeting of the Albany Medical College Alumni Association of New England was held in Springfield, Mass., May 23, under the presidency of Dr. Walter G. Murphy, Hartford Conn. The following officers were elected: president, Dr. Aaron L. Newton, Northfield, Mass.; vice-president, Dr. George H. Janes, Westfield, Mass.; secretary, Dr. Edgar C. Collins, Springfield, Mass.; treasurer, Dr. Harvey W. Van Allen, Springfield, Mass.; members of the board of governors, Dr. Elmore S. Allbee, Bellows Falls, Vt.; the treasurer, Dr. Creighton W. Skelton, Providence, R. I.; Dr. Frederick T. Clark, Westfield, Mass., and Dr. C. W. Crowthers, Springfield.

Tropical Diseases.—Dr. John R. McDill, Manila, professor of surgery in the College of Medicine and Surgery, University of the Philippines, announces that the institution is contemplating the publication of a work on the most common and frequent diseases in the tropics, and asks physicians to forward any reports or statistics of institutions, reprints or publications and personal observations for use in this work. To this request is appended a numbered list of the subjects on which information is desired. An especial request is made for information concerning the relative frequency or absence of certain diseases among the native population, as compared with diseases familiar to the observer in his home land; as, for instance, hypertrophy of the prostate which is common in the United States but has not been observed in a single instance in Manila, and Hodgkin's disease, which is comparatively rare in the United States but is very common in the Philippines. Varicose conditions are relatively uncommon in the Philippine Islands. Ludwig's angina is regularly encountered there, and unless treated early and promptly is very fatal. Photographs of interesting cases, with data, are requested; the English, German, Spanish or French language may be used.

Gynecoiatry and Gynecology.—According to its derivation, gynecology signifies the science that treats of the normal functions peculiar to women and it does not include pathologic conditions and treatment for them. For the science of treating the affections peculiar to women, the scientific term is "gynecoiatry," constructed like the term "psychiatry." At the recent South American medical congress a resolution presented by A. d'Alessandro, of Buenos Aires, advocating the use of the term gynecoiatry as the name for the specialty, was formally adopted. The *Semana Medica* reproduces the resolution as written out, with the signatures of all the members of the congress present, including Pozzi, Dührssen and Doléris from Europe, all going on record as favoring "gynecoiatry." The resolution stated in its preamble that men of science should reject terms that are the products of empiricism and should adopt rational terms, and that the ending "iatry," meaning treatment, is more suitable for the specialty than "ology," which means merely the science or physiology of women.

Congress of Tropical Medicine.—The Far Eastern Association of Tropical Medicine announces that the Second Biennial Congress will be held at Hongkong, China, Jan. 20-27, 1912, under the presidency of Dr. J. Mitford Atkinson, Hongkong. The general classification of the work of the congress is included in the following groups of subjects:

1. Protozoology—helminthology.
2. Cholera—plague—leprosy—tuberculosis.
3. Tropical Fevers—malaria—beri-beri—dysentery.
4. Surgery—obstetrics—infantile diseases.
5. Climate—hygiene—sanitation.

It is requested by Dr. Francis Clark, secretary-treasurer general, Hongkong, that abstracts in English or papers be forwarded to him as soon as convenient. Papers may be read in English, French or German.

FOREIGN NEWS

Chinese Aids University Hospital.—The University of Pennsylvania Medical School and Hospital in Canton, China, has received a gift of $500 from a Chinese patient who had been treated in that institution. This is the first large gift from a native resident to the work of the university in China.

Damages for Misuse of Plaintiff's Name.—The proprietors of a German patent medicine sent a package of their product, Rad-Jo, to the physician of the Queen of Holland with a guarantee that it would facilitate her impending accouchement. The physician in question, Professor Kouwer of Amsterdam, paid no attention to the package, but when the newspapers announced the normal childbirth of the queen, the proprietors of Rad-Jo at once advertised extensively that it was responsible for the satisfactory accouchement and cited an alleged interview with Professor Kouwer to that effect. He at once sued the firm for damages for this false statement, and the last mail brings word that the German court has decided in his favor, also imposing a penalty of $375 for each of the circulars distributed in future with possibly six months' imprisonment additional.

LONDON LETTER

(*From Our Regular Correspondent*)

LONDON, June 10, 1911.

Onchocerciasis

Dr. A. W. J. MacFadden, inspector of the local government board, has made an important report on onchocerciasis—nodules recently found in the frozen quarters of Australian meat, due to a parasitic worm formerly called *Spiroptera reticulata*, which occurs in Australian cattle. The nodules were at first thought to be merely a surface affection and easily capable of removal, but later they were found more deeply situated, especially in the intermuscular fat. Careful examination of many quarters showed that to secure freedom from the nodules, it would be necessary either to examine in detail every forequarter or else cut off from it those parts, namely, the briskets, to which they are chiefly confined. As the first course was impracticable, the second was adopted. The meat was kept in cold storage until all the flanks and briskets had been sawn off. These alone were detained for further examination, subject to the wish of the importer to utilize them further. If he gave notice that they were required only for industrial purposes, they were allowed to be removed after being rendered unfit for food. If on the other hand, they were to be used for food, they were thawed out, cut up and examined. As hindquarters were affected only around the stifle-joint, all that was necessary was to make an incision into it while frozen to pass or reject the pieces.

A report on the structure and bionomic characters of the parasite has been made by Dr. R. T. Leiper, F.Z.S. He considers that it should be included in the genus *Onchocerca* and not in that of *Spiroptera*. He has therefore proposed the name onchocerciasis. The parasite was first observed by Morris of Sydney in 1880 and since then has been found in different parts of Australia. It has also been observed in cattle from the United States, the Malay States, Java and India. The parasites are long thread-like worms and, so far as is known, cannot develop to sexual maturity within the body of the host in which they are born, without passing outside. At present nothing is known of their extra-corporeal life or of the mode of entry or exit from the host, but analogy with other members of the Filariidæ suggest that they take up their abode in some arthropod, probably a biting insect. The worms and their young do not appear to survive the death of the cattle more than a few hours. The health authorities do not agree with the view expressed by some that the nodules are of no importance to the consumer and merely interfere with the appearance of the meat. They are the product of changes in the tissues, resulting from some active toxin excreted by the worms.

Paper-Bag Cookery

Considerable attention is being given in the press to a new method of cookery in paper bags which has been devised by a well-known chef, M. Soyer. The food, whether meat, fish, fowl, vegetables or even stews, is inserted into a specially prepared paper bag, which is generally greased and placed in the oven. It is claimed that the result is simply perfect, as the natural flavors of the food are preserved, and that a great saving of time and trouble is effected, as the cleansing of numerous pots and pans becomes unnecessary. Moreover, the objectionable smell of cooking throughout the house is avoided.

Japanese Mice for Cancer Research

Three hundred and sixty waltzing mice have just arrived for the National Cancer Research Fund. They were sent to Dr. E. F. Bashford, the director, by Professor Higuchi of Tokio, who recently completed a course of research work in the Fund's laboratories. The mice will be used to determine the effects of acclimatization and dieting in increasing or decreasing the susceptibility of mouse-tissues to mouse cancer. It has already been found in the laboratories that if living cancer tissues from English mice are implanted on recently imported foreign mice, there is a certain amount of resistance to growth. Only a small percentage of the inoculated mice develop tumors, but after a time this protection wears off and finally foreign mice become as susceptible as English mice.

The Mine Accidents Act

In a previous letter to THE JOURNAL the recent act to prevent accidents in mines has been described. The Home Secretary has now issued the following order. Rescue brigades consisting of not less than five persons employed at the mine who have been selected on account of their knowledge of underground work, coolness and powers of endurance, and who have been trained in first aid, shall be maintained at every mine. Where the number of workers is less than 250, one brigade is to be formed; when from 250 to 500, two brigades; when from 500 to 800, three brigades; and when over 800, four brigades. Where the total number of underground workers is less than 100 the manager of the mine shall have the privilege of calling for a brigade from a central rescue station. No person unless authorized by the management or by the official present at the surface, shall be allowed to enter a mine after an explosion of firedamp and coal-dust, or after the occurrence of a fire, for the purpose of engaging in any rescue work. No rescue brigade shall be deemed competent unless it undergoes a course of training approved by the secretary of state. At a mine which maintains a rescue brigade there shall be kept two or more small birds or mice for testing carbon monoxid, two electric hand lamps for each brigade, one oxygen reviving apparatus, a safety lamp for each member of the brigade for testing for firedamp, and an ambulance box. At each central rescue station not less than fifteen complete sets of breathing-apparatus shall be maintained with the necessary number of hand-lamps and oxygen reviving apparatus, and a motor car in constant readiness. Special rules for sidings and for the installation and use of electricity in mines are also proposed. The use of electricity is to be prohibited in any part of a mine where it would be dangerous on account of the risk of explosion of gas or coal-dust. Provision is also made for cutting off the supply of current to the mine at the surface, in order to prevent danger.

Disease as an Aid to Natural Selection

At the Eugenics Education Society the new president, Major Leonard Darwin, one of the three sons, all eminent in science, of the great evolutionist, said that disease produced beneficial results in preventing sickly stock from reaching maturity and reproducing. Any improvement in environment of mankind lessened disease, and every success in the efforts toward its curb would tend to prevent natural selection. The campaign against disease, of which all warmly approved, was in some ways having anti-eugenic effects, and it was necessary to see that it was accompanied by other reforms tending to counteract its evil influences. There was an inevitable temptation of social reformers to concentrate the attack on those points where the results seemed to be most obvious and immediate. The misery and disease which surrounded us seemed to demand immediate attention and it needed a distinct effort to divert our thoughts to the no less real needs of unborn generations. A less creditable loadstone, the voting power of the people, acted in the same direction. Both the philanthropist and the politician always found themselves under the temptation, if not actually to turn a deaf ear to the eugenic reformer, at all events to devote their whole energies to securing immediate results. He urged that one group of societies should be maintained which was pledged to put aside all other objects, in order to improve the racial qualities of future generations. The most obvious and crying need for reform was the segregation of the feeble-minded, with a view to diminish their now alarming rapid reproduction. A similar need existed with regard to lunatics, criminals, habitual drunkards and the unemployable, but the difficulties were greater because segregation, to be effective, involved the imprisonment of those apparently in possession of their faculties. The need for some action, however, was urgent. Another method of benefiting future generations was the introduction of further

safeguards, with the object of lessening the probabilities of marriages being contracted with one party ignorant that the life-history of the other contained heritable defects capable of appearing in the next generation. Another important subject for the consideration of the eugenist was the incidence of taxation so far as it tended to force the intelligent and thrifty to support the mentally feeble and wastrel. It was probable that every increase of rates or taxes tended to diminish reproduction. The more the self-respecting and prudent sections of the community were hit by taxation, the greater the anti-eugenic effect produced. Every increase in the burden thus thrown on the nation must harm the race, unless those who were not exposed to it, because considered incapable of bearing it, were prevented from reproducing. Arrangements are being made for an International Congress on Eugenics in London next year.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, June 9, 1911.

First Annual French Medicolegal Congress

This congress was held in Paris, May 29 and 30. Up to the present, medical jurists have had no other organization to bring them together than the Société de médecine légale, which is attended especially by Parisians, and the international medical congresses, in which the little section of legal medicine was almost lost among the sections representing the more numerous and more prominent other branches of medicine. The annual congress of legal medicine will admit as members, in the first place, physicians of France or French-speaking countries who are interested in any way in legal medicine, also physicians of foreign non-French-speaking countries, French, the official language, being used exclusively. In exceptional instances, scientists who are not physicians, but whose researches apply to legal medicine, may be admitted as members. In the second place, the members will be jurisconsults (magistrates, lawyers, etc.) of France or French-speaking countries, or foreigners of non-French-speaking countries under the previously defined conditions. Questions of exclusively national interest may be voted on only by members of the congress who are physicians of the country in question. The congress will hold its annual session at the end of May in a city of France or some French-speaking country, to be designated at the session of the previous year. The next congress will be held at Paris under the presidency of Dr. Lacassagne, professor of legal medicine at the Faculté de médecine de Lyon. The question which will form the subject of a paper at the next congress is "Cerebral Traumatic Hemorrhages," by Dr. Etienne Martin, *agrégé* professor at the Faculté de Lyon, and Dr. Paul Ribierre, physician of the hospitals of Paris.

Vacant Chairs at the Paris Medical School

The minister of public instruction has just declared vacant the chair of history of medicine and surgery at the Faculté de médecine de Paris, which was occupied by Dr. Chauffard, recently appointed professor of clinical medicine.

This makes three chairs at the Faculté de médecine which are vacant at present, including the chair of medical physics, vacant through the retirement of Professor Gariel, and that of medical pathology through the nomination of Dr. Dejerine as clinical professor of diseases of the nervous system.

Subscription for the Beyrouth Medical School

The Syndicat de la Presse parisienne has just opened a national subscription for the French hospital and the Faculté de médecine de Beyrouth to obtain the necessary funds for the working and the development of the services of the two institutions which have become insufficient (THE JOURNAL, April 15, 1911, p. 1122). More than $20,000 (100,000 francs) have already been subscribed.

The most eminent professors of Paris, Lyons, Bordeaux, Toulouse, Montpellier, Lille and Nancy, without distinction of party or creed, have called attention to the situation of the Faculté catholique et française de Beyrouth.

Personal

On May 30, the Académie de médecine elected Dr. Lermoyez, who is a physician of the Hôpital Saint-Antoine, and especially well known as a specialist in diseases of the larynx, nose and ears, as a member in the section of therapeutics and medicine, in place of Dr. Huchard, who died last December.

M. Lapicque has been appointed professor of general physiology at the Muséum d'histoire naturelle in place of Dr. Nestor Gréhant, who died March, 1910.

Dr. Chauffard, professor of the history of medicine and surgery at the Faculté de médecine de Paris, has been appointed, at his request, professor of clinical medicine at the same institution.

Inauguration of the Institute of Infantile Hygiene

On March 8, at the Hospice des Enfants-Assistés, the new Institut de puériculture (THE JOURNAL, Jan. 28, 1911, p. 283) was inaugurated, Dr. Variot being the initiator and director.

Altitude in the Treatment of Infantile Eczema

Dr. Marfan, professor of therapeutics at the Faculté de médecine de Paris, on May 30 called attention before the Académie de médecine to the good results which he had obtained in certain serious forms of infantile eczema, which were resistant to all the usual means of treatment, by sojourn in the mountains at a height of over 3,000 or 4,500 feet (1,000 or 1,500 meters). Having observed, empirically, such results, Dr. Marfan employed altitude in the treatment of fifteen serious cases of infantile eczema, and the treatment failed completely in only one case. The course was uniformly favorable in all the others. During the first four or five days, the situation does not change. Sometimes the pruritus and insomnia even seem to increase, then in a week or less, improvement sets in, the eruption grows pale and becomes drier, the pruritus diminishes, agitation disappears and sleep returns. After a couple of weeks there remain some spots of dry and somewhat squamous eczema and the pruritus is almost gone. Then the weight increases and growth resumes its normal course. This improvement continues during the entire sojourn in the mountains. The return to the lowlands takes place usually after a month or six weeks. In three cases the improvement or cure was maintained without relapse. In seven infants there were slight relapses but the disease never attained the intensity it had before the treatment. In three cases there were, after return, rather serious attacks which did not last long and were not accompanied by serious disturbances of the general condition. Sojourn in the country or by the seaside undoubtedly may have a favorable influence on infantile eczema, but in its serious forms this influence does not seem comparable to that of altitude. The latter treatment may, however, be reserved for serious and inveterate forms of infantile eczema with loss of sleep and weight and should not be employed until after the failure of ordinary means. It should be understood that all the general rules for the treatment of eczema should be observed during the altitude treatment. The latter may be carried on in all seasons; it is, perhaps, more effective in winter than in summer.

The Determination of Sex

At one of the last sessions of the Académie des Sciences, Dr. R. Robinson made a report on observations tending to establish a relation between insufficiency of the adrenals and determination of sex. Fifteen women presenting evident signs of insufficiency of the adrenal glands gave birth to fifteen daughters. Robinson believes that this fact has a scientific bearing on the theory or law of crossed heredity, according to which sex is determined, not by the more vigorous of the parents, but oppositely. Schenk, who has published a work on the means of influencing the sex of the embryo at will, attributes the inferiority or the difference of the two parents to the incompetency of organic metabolism in one or the other of the latter. Robinson believes that, at bottom, Schenk is right, but that there remains to be shown to what the disturbances of the nutritive metabolism are due and what are the means of regulating them. Robinson thinks that the ductless glands, in general, and the adrenals, in particular, are the only causes of these functional disturbances. Since a woman who presents disturbances of nutrition, vomiting, pigmentation, etc., is rendered inferior by her adrenals, and since such women have given birth to daughters fifteen times out of fifteen, there is only one means of producing a different sex. That is opotherapy by epinephrin.

Cremation

The Société pour la propagation de l'incinération has just held its annual meeting presided over by M. Barrier, member of the Académie de médecine. The secretary-general reported that the number of cremations in 1910 was 473, an increase of 20 per cent. over the number of 1909. The total number of cremations since 1899 when the crematory furnace was opened in the cemetery of Père-Lachaise in Paris amounts to 106,096. This number includes the bodies from the hospitals.

Gift to the Academy of Medicine

Lieutenant Kelsch, son of the *médecin inspecteur* of the armies, who recently died, has donated to the Académie de médecine the medical library and scientific papers of his father.

Measures Against Opium

One hundred and fifty senators, belonging to all political groups of the senate, have just offered a bill for the regulation of the importation, the sale, the storage and the use of opium and its extracts. The bill emphasizes the extent of social danger present from the use of opium. There are, at present, in Brest, Toulon, Marseilles and Paris, opium-joints like those in China and Cochin-China, frequented every night by a constantly increasing clientele.

The Stature of French Women

Up to the present there have been no definite data furnished in regard to the average characteristics of the French woman. The women measured by anthropologists have been, according to their own statements, organically inferior; in fact, they were the subjects used for dissection at the Faculté de médecine. Certain classes of the population do not come to the dissecting tables. Therefore, Dr. A. Marie, physician of the Asile Villejuif, and Dr. Leon Mac-Auliffe have studied about 250 Frenchwomen, aged from 21 to 50, coming from various parts of France, and belonging to all social classes, as far as possible in equal proportion. Fifty were agricultural laborers, fifty Parisian working women, fifty women of the bourgeoisie without professions, and fifty belonging to the old aristocracy, some of whom were members of liberal professions; fifty were measured at the Asile de Maison-Blanche. These measurements, of which Drs. Marie and Mac-Auliffe have just communicated the results to the Académie des sciences, show that the stature of the French woman is not 1.54 meters (about 5 feet ½ inch), as has been thought hitherto, but 1.57 meters (about 5 feet 1½ inches).

The tables drawn up by Drs. Marie and Mac-Auliffe seem likely to be serviceable, not only to anthropologists, but to criminologists and medical jurists. They will make it possible, in fact, by the measurement of a segment of a member to estimate the approximate height of the body and the principal dimensions.

BERLIN LETTER

(*From Our Regular Correspondent*)

BERLIN, June 1, 1911.

Personal

The well-known neurologist, Professor Eulenburg of Berlin, celebrated the semi-centennial of his doctorate May 31.

Professor v. Esmarch of Göttingen has resigned the direction of the hygienic institute on account of illness and has been relieved from giving lectures.

The Imperial Insurance Bill

At the final third reading of the national insurance bill the majority party at the last moment adopted two amendments which involve a deterioration of the economic status of the medical profession and consequent injury to the hygienic conditions of the country districts. The first amendment provides that the provisions of the insurance law shall extend to those whose incomes amount to $625 (2,500 marks) instead of $500 (2,000 marks), that is, $12 a week, instead of under $10. By this vote hundreds of thousands of employees will be withdrawn from private practice and transferred to contract practice, and in this way the field of the general practitioner will be still further restricted and his income reduced. It is easy to understand, therefore, that the German medical profession will raise a vigorous protest against this measure and will try so far as is possible by legal means to avert the damage that is likely to arise from it. The amendment affecting the hygienic status of the rural districts consists in a provision which permits the Krankenkassen in the country to allow assistance to a lying-in woman for only four weeks instead of eight, as is required of the Krankenkassen in the cities. The danger of illness and death for both mother and child are thus increased by the shortening of the time during which the mother can devote her time to the care of herself and the child, on account of the lack of state aid. This is the more to be regretted since the infant mortality is much higher in the country districts than it should be. The attempt to induce mothers to nurse their offspring receives little encouragement from this measure, which is also of importance since an investigation reported by me last year has shown that the peasants often sell the good milk and save milk of inferior value for their own use. It will require the aid of private charity to compensate for the damage that will result from this resolution of the Reichstag.

Vacation Open-Air Schools in Charlottenburg

The marked success which has attended open-air public schools in the lower grades has led to the establishment of a similar school for pupils able to pay, during the long vacation. The children remain during the day under the care of their teachers, but return at evening to their parents. For care which consists of lunch, dinner and milk in the afternoon, each child pays 50 cents per day.

Prize for Essay on Racial Hygiene

A popular periodical published in Frankfurt a. M. has offered a prize of $250 (1,000 marks) for the best essay on the theme, "What is the Cost of the Degenerate Elements of the Race to the State and to Society?" In the announcement the following interesting observations are made: The laboring, wealth-producing portion of the population is obliged to support not only itself, but also all those who either cannot or will not work. In this way a heavy burden is laid on their shoulders. From a part of this burden they can never be freed. Always those who are at an age in which they are able to work must expect to replace in the care of the aged and the upbringing of children the amount which their own upbringing has cost. But the laboring population could be freed from a large part of this burden. For they must devote their efforts not only to the support of the children and the aged, but also to the support and care of the sick and defectives who are temporarily or permanently unfit for work or are unwilling to work. Immense sums in money, time and labor could be saved if by improvement of the environment in the widest sense the production of sick, crippled, insane, criminals and paupers unable to work could be prevented. But all efforts at betterment of our surroundings will fail so long as there are congenital and inherited disease and defectiveness, and the workers can be freed from this avoidable burden only by preventing the production of the sick and defective as far as possible. They are not harmful merely because they produce nothing, but also from the actual damage that they do to persons and property either consciously or unwittingly. Hindrance of the production or reproduction of those below par (*Minusvarianten*) is becoming a constantly more pressing demand in our time which is devoting itself constantly more conscientiously and more successfully to preserving the life of those who have been already born.

In all publications that have to do with the improvement of the race, reference is made to the sums which the state, the community and the private citizen must expend directly and indirectly for persons who had much better never have been born. How many thousands of worthy citizens must leave useful labor in order to devote themselves to the care of these individuals as nurses, physicians and officials! Unfortunately no critically examined, numerical data have hitherto been available in this matter which have been collected by a thorough investigation of a smaller or larger territorial division, such as a country or municipal district, a governmental division or even a province. It is only by the collection of such statistics that other communities can be aroused to the importance of this matter. An estimate of the entire cost of the defectives in a large government district should first be secured. Then the part which is contributed to this sum by the care of those affected by congenital and hereditary defect can be determined so far as the available material permits.

The competition for the prize is open to every one, but the article must be written in the German language or be accompanied by a translation into German.

Flower Tag Days

The flower days of which I have spoken have been very successful in some of the cities in which they have been held. In Bremen, $21,000 ($2,000 marks), in Hanover, $22,500, in Breslau, $42,500, and in Hamburg, $100,000, were received in one day. These facts substantiate the prediction which I made in a previous letter, and I believe that a similar success will be achieved in Berlin.

Tuberculosis as a Housing Disease

The investigations carried out by the tuberculosis hygiene station in our neighboring city, Schöneberg, have confirmed the fact emphasized by Robert Koch that tuberculosis is largely dependent on the housing conditions. From April to June of last year, 400 unselected dwellings in which 439 tuberculous patients lived, were systematically inspected. Fifteen of the

affected families occupied merely a kitchen and in 245 cases the dwelling consisted of a kitchen and bedroom only. In 7 per cent. of all the dwellings the space of the room occupied by the patient as a bedroom was not equal to 10 cubic meters per person; 386 patients slept in the same rooms with 749 persons not recognizably tuberculous, 570 of whom were children. Only 46 persons had a bedroom separate from the healthy; in 13 of these cases the kitchen was used as the bedroom. On the ground of these results the director of the tuberculosis dispensary (*Fürsorgestelle*) comes again to the conclusion that the removal of patients with open tuberculosis to hospitals and sanatoriums is the best way to counteract the evils arising from the conveyance of infection by the dwelling. At least the severely sick should be removed. Gratuitous disinfection is necessary after death and also periodically during the life of the patient—measures which are not enforced by law in Prussia.

VIENNA LETTER

(From Our Regular Correspondent)

VIENNA, June 6, 1911.

Gifts for a Cancer Hospital and a Scarlet Fever Ward

The newly formed society for cancer research in Austria has just now received a substantial grant of 1,000,000 kronen ($250,000) for the purpose of pursuing its scientific research on human cancer. A lady in private life, who was during her lifetime an anonymous benefactor of numerous charitable institutions in this city—the municipality of Vienna conferred on her a special mark of distinction as "an anonymous benefactor of mankind"—devoted her large estate and residue to the benefit of the poor sick. Her trustees convoked a jury of medical men, and it was decided, after some discussion, to hand over the above-mentioned sum to the society for cancer research, while half that sum has been given to the children's hospital in the tenth district. There a large pavilion or two will be erected solely for cases of scarlet fever, and in various other children's hospitals similar wards will be established as long as the funds permit. The cancer society, of which Professor von Eiselsberg is the president, will erect a hospital for 100 beds, for neoplasmas alone. This most welcome addition to the research outfit of science will no doubt prove a most valuable and indispensable weapon in the fight against malignant disease. Like Czerny's cancer hospital, it will form a center of learning and investigation, and perhaps of renewed hope. In this country we are not used to wealthy persons giving such large gifts for charity or science; the more one must appreciate the clear insight of a woman.

A Fresh Case of Cholera

Owing to the strict measures taken against cholera in Austria-Hungary last autumn, the disease was stamped out half a year ago from our empire. But a few days ago a person in Graz, the capital of mountain-bound Styria, 100 miles from Vienna, was taken to a hospital in a most suspicious condition and died there. Asiatic cholera was diagnosed beyond doubt. The infection of the victim was traced to Venice. Strictest disinfectant and prophylactic measures were adopted at once; a quarantine was imposed on all persons known to have been in touch with the deceased man within the last week. At present there is every reason to hope that the outbreak will be suppressed very quickly. There has been no case of cholera reported on in Italy for several months, and in spite of the International Cholera Convention nothing was known of any such case being reported in Venice. It remains to be seen how it was possible for this patient to contract the disease in Venice.

Scarcity of Dwellings and Decline of Consumption of Meat in Vienna

Within the last few years the cost of living has increased in this city by more than 25 per cent. as a consequence of two facts pointed out in the report of the health bureau of Vienna. These are: the increase of the rent for lodgings and the general increase of the price of food, chiefly of meat. These two facts tend to hamper seriously the hygienic progress of the poorer classes. The report shows that the number of empty dwellings (including those in new houses, for which permission for inhabiting had not yet been given) was 5,420 in the year of 1906, while last year only 2,900 such dwellings were counted. The rent has gone up from 10 to 15 per cent. for the larger flats and tenements (four to eight rooms), from 15 to 25 per cent. in the medium-sized lodgings (two to four rooms), and to more than 30 per cent. for the smaller lodgings—the workingmen's lodgings. The price of meat has gone up from 30 to 40 per cent. during the last five years, and the consumption has promptly declined. The average consumption of this proteid food per head was 75 kilos (150 pounds) yearly some twelve years ago. It was between 75 tnd 72 kilos until 1905, and since then a constant fall was noticed until in 1910 it stood at 66 kilos (133 pounds), indicating a decrease of 9 per cent. in five years. In vain the medical circles and also the military authorities pressed for permission to import frozen meat. The influence of the agrarian landowners has kept the duty on meat so high as to make importation impossible. The effect on general health and on national physique will not be marked until some more years pass; meanwhile the deterioration will go on until public investigation compels a change of legislation.

Dentistry for Women

With the increase in the number of female medical students, the question of appropriate employment of the women physicians had to be answered. In our country people are not yet accustomed to calling on a lady in case of illness, and the majority of those women who are practicing hold appointments in a club or a "Krankenkasse." A memorandum by a private medical association requests the faculty of the Austrian universities to point out to female physicians and students that dentistry would be a good field for their abilities. The exactness and neatness of the work required from the standpoint of a dental treatment, the openings in medium-sized towns, where hitherto only dental technicians are working on and in the patients' mouths, and, perhaps, the lesser trouble make this branch of our art really advisable for the female physicians. In this country, each dentist must be a fully qualified M.D., and a law is in preparation which will do away with the dental technician of the present times who is no doctor, but still practices dental surgery. A number of ladies are now employed by some of our well-known dentists, and it must be stated that, for instance, in the dentistry schools, the female physicians are preferred by the patients of their own sex. Therefore, the recommendation of dentistry has been received with great approval by those interested in the question.

The Public Service

Medical Department, U. S. Army

Changes for the week ended June 17, 1911.

Kellam, F. C. A., M.R.C., ordered to active duty and will proceed to the Walter Reed General Hospital, Takoma Park, D. C., for duty.

McCaw, Walter D., lieut.-col., detailed as instructor in hygiene and sanitation at the school for officers of the Medical Corps, National Guard of New York, Pine Camp, N. Y., Aug. 5 to 13, 1911.

Reynolds, Charles R., major, detailed as instructor in map reading, sanitary units and allied subjects, at above camp, at Pine Camp, N. Y.

Norman, Seaton, M.R.C., relieved from duty in the Department of Texas on return of Major Robert B. Grubbs, Medical Corps, and then return to Fort Leavenworth, Kan. Lieutenant Norman will proceed to his home and on arrival will stand relieved from duty in the Medical Reserve Corps.

McMillan, C. W., lieut., left Base Hospital, Fort Sam Houston, Texas, on fifteen days' leave of absence.

The following named officers, Medical Corps, are relieved from duty in the Philippine Islands and will then proceed, November 15, to San Francisco, and on arrival report to the adjutant general of the Army for further orders: Major A. W. Morse, First Lieut. J. R. Barber, First Lieut. E. G. Huber, First Lieut. A. D. Parce and First Lieut. J. A. Wilson.

Cullen, C. W., M.R.C., returned to Fort D. A. Russell, Wyo., from temporary duty at Fort Duchesne, Utah.

The following named officers, Medical Corps, are relieved from duty in the Philippine Islands and will proceed, December 15, to San Francisco, and on arrival report to the adjutant general of the Army for further orders: Lieut.-Col. C. E. Woodruff, Major C. C. McCulloch, Major W. E. Purviance, Captain J. R. Bosley and First Lieut. J. B. H. Waring.

The following named officers, Medical Corps, are relieved from duty in the Philippine Islands and will proceed, December 15, to San Francisco, and on arrival report to the adjutant general of the Army for further orders: First Lieuts. V. E. Watkins, A. M. Guittard and F. J. Conzelmann.

The following named officers of the Medical and Medical Reserve Corps will proceed to the Philippines Division for duty on the transport sailing from San Francisco, Nov. 5, 1911: Major R. N. Winn, M.C.; Major F. C. Baker, M.C.; Captain H. F. Pipes, M.C.; First Lieut. E. G. Worthington, M.C.; First Lieut. J. P. Fletcher, M.C.; First Lieut. E. A. Anderson, M.R.C., and First Lieut. G. Newlove, M.R.C.

The following named officers of the Medical and Medical Reserve Corps will proceed to the Philippines Division for duty on the transport sailing from San Francisco, Dec. 5, 1911: Major J. H. Ford, M.C.; Major J. W. Van Dusen, M.C.; First Lieut. L. S. Hughes, M.C.; First Lieut. A. S. Bowen, M.C.; First Lieut. J. A. Burket, M.C.; First Lieut. F. R. Hill, M.C.; First Lieut. H. Priest, M.R.C.; First Lieut. A. H. Eber, M.R.C., and First Lieut T. S. Lowe, M.R.C.

Thomason, H. D., captain, will proceed to Nashville and Memphis, Tenn., for purpose of assisting in reorganization of sanitary troops of state, and on completion of this duty return to his proper station.

Clayton, George R., M.R.C., ordered to duty with Battery F, 5th Art., camp instruction, Sparta, Wis.

Birmingham, H. P., lieut.-col., Straub, P. F., major, and Darnell, Carl R., major, appointed members of board to meet at San Antonio, Texas, to consider defects in field organization for the Hospital Corps and to make recommendation for their betterment and to prepare a provisional manual for the management of field hospitals and ambulance companies.

Hall, James F., captain, ordered to Fort D. A. Russell, Wyo., for temporary duty.

Worthington, Joseph A., lieut., ordered to the Presidio of Monterey, Cal., for temporary duty.

Snyder, Howard M., lieut., left Fort D. A. Russell, en route to Fort Leavenworth, Kan., on detached duty.

Clayton, George R., M.R.C., ordered to duty with Battery F, 5th Artillery, camp at Sparta, Wis.

Ruddy, William P. J., M.R.C., reported for temporary duty at Washington Barracks, D. C.

Purnell, Harry S., captain, left Madison Barracks, N. Y., with troops en route to Pine Camp, N. Y., for duty.

Connor, C. H., captain, left San Antonio, Texas, en route to Fort Sill, Okla., to accompany troops to San Francisco.

Skelton, Robert, M.R.C., left Fort Jay, N. Y., en route to target range, Rensselaer, N. Y., for duty.

Lynch, Charles, M.C., is ordered to proceed to Los Angeles, Cal., thence to San Francisco, thence to Chicago, on official business pertaining to the American Red Cross.

Woodbury, Frank T., major, relieved from further duty at Fort Assiniboine, Mont.

Davis, William T., captain, left Washington, D. C., on ten days' leave of absence.

Appel, D. M., colonel, relieved from duty at Atlanta, Ga., to take effect July 1, 1911, and will report for duty to commanding officer, Fort Sam Houston, Texas.

Perley, Harry O., colonel, relieved from duty at Denver, to take effect July 1, 1911, and will report to the commanding officer, Fort D. A. Russell, Wyo., for duty.

Gray, William W., colonel, relieved from temporary duty at Omaha, and further duty at St. Paul, Minn., to take effect July 1, 1911, and will proceed to San Francisco and assume charge of the medical supply depot in that city.

Davis, William B., colonel, order to report to commanding general, Department of Texas, revoked, and on expiration of leave of absence to proceed to Fort Leavenworth, Kan., and report in person to commanding officer for duty at that post.

The following named officers of the Medical Corps are relieved from further duty at the Army medical school and will comply with orders from the commanding general of troops, San Diego, Cal.: First Lieuts. William T. Cade, Jr., Herbert H. Sharpe, Francis X. Strong, Allevne von Schrader, Robert C. McDonald, Harry G. Ford, James F. Johnston, Paul W. Gibson, Bert R. Huntington.

Medical Corps, U. S. Navy

Changes during the week ended June 17, 1911.

Harlan, T., asst.-surg., detached from the *Quiros* and ordered to duty at the naval hospital, Canacao, P. I.

Pratt, L. L., and Omelvena, F. G., asst.-surgs., ordered to duty at the naval hospital, Canacao, P. I.

O'Malley, J. J., asst.-surg., ordered to the *Quiros*.

Reed, T. W., P. A. surgeon, detached from the *Wolverine* and ordered to the *Maine*.

U. S. Public Health and Marine-Hospital Service

Changes for the seven days ended June 14, 1911.

Oakley, J. H., surgeon, granted seven days' leave of absence from June 7, 1911, under paragraph 191, Service Regulations.

Lumsden, L. L., P. A. surgeon, directed to proceed immediately to North Yakima, Wash., and investigate an outbreak of typhoid.

Wille, C. W., P. A. surgeon, granted seven days' leave of absence from June 13, 1911.

McCoy, G. W., P. A. surgeon, detailed to attend the annual meeting of the American Medical Association to be held in Los Angeles, Cal., June 27-30, 1911.

Ridlon, J. R., asst.-surg., granted thirty days' leave of absence from June 12, 1911.

Hotchkiss, S. C., asst.-surg., detailed to join "mine rescue car" for duty in Colorado in connection with Bureau of Mines.

Stiles, C. W., professor of chemistry, directed to proceed to Wilmington, N. C., on special temporary duty.

Brice, J. W., A. A. surgeon, granted thirty days' leave of absence from July 1, 1911, with pay, and two months' leave of absence from Aug. 1, 1911, without pay.

Light, S. D. W., A. A. surgeon, granted thirty days' leave of absence from June 6, 1911.

Wetmore, W. O., A. A. surgeon, granted nine days' leave of absence from May 22, 1911, on account of sickness.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, July 11. Chairman, Dr. W. H. Sanders.

ARIZONA: Phoenix, July 5-6. Sec., Dr. Ancil Martin.

COLORADO: Denver, July 5. Sec., Dr. S. D. Van Meter, 1723 Tremont Street.

CONNECTICUT: Regular, City Hall, New Haven, July 11-12. Sec., Dr. Charles A. Tuttle, 196 York St.; Homeopathic, Grace Hospital, New Haven, July 11. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave.; Eclectic, Hotel Garde, New Haven, July 11, Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

INDIANA: Room 120 State House, Indianapolis, July 11-13. Sec., Dr. W. T. Gott, Crawfordsville.

MAINE: State House, Augusta, July 6-7. Sec., Dr. Frank W. Searle, 806 Congress St., Portland.

MASSACHUSETTS: State House, Boston, July 11-13. Sec., Dr. Edwin B. Harvey.

NEW HAMPSHIRE: State House, Concord, July 6-7. Regent, Mr. Henry C. Morrison.

NEW MEXICO: The Capitol, Santa Fe, July 10-11. Sec., Dr. J. A. Massie.

NEW YORK: June 27-30. Mr. Harlan H. Horner, Chief of Examinations Division, Department of Education, Albany.

NORTH DAKOTA: Grand Forks, July 5. Sec., Dr. H. M. Wheeler.

OKLAHOMA: Ione Hotel, Guthrie, July 11. Sec., Dr. John W. Duke.

OREGON: Portland, July 4. Sec., Dr. E. B. McDaniel, 704 Electric Building.

PENNSYLVANIA: Regular, Homeopathic and Eclectic, Philadelphia and Pittsburg, June 27-30. Secretary of the Medical Council, Mr. Nathan C. Schaeffer, Harrisburg.

RHODE ISLAND: State House, Providence, July 6-7. Sec., Dr. Garner T. Swarts.

SOUTH DAKOTA: Mitchell, July 12-13. Sec., Dr. F. W. Freyberg, Mitchell.

TEXAS: Austin, June 27-29. Sec., Dr. J. D. Mitchell, Fort Worth.

UTAH: State House, Salt Lake City, July 5-6. Sec., Dr. G. F. Harding, 310 Templeton Building.

VERMONT: Burlington, July 11-13. Sec., Dr. W. Scott May, Underhill.

WASHINGTON: Tacoma, July 4. Sec., Dr. F. P. Witter, Traders Block, Spokane.

WEST VIRGINIA: Capitol Building, Charleston, July 10-12. Sec., Dr. H. A. Barbee, Point Pleasant.

WISCONSIN: Madison, July 11-13. Sec., Dr. John M. Beffel, 3200 Clybourn St., Milwaukee.

Massachusetts March and May Reports

Dr. Edwin B. Harvey, secretary of the Massachusetts Board of Registration in Medicine, reports the oral, practical and written examinations held at Boston, March 14-16 and May 9-11, 1911. The number of subjects examined in was 13; total number of questions asked, 70; percentage required to pass, 75. At the examination held in March the total number of candidates examined was 64, of whom 42 passed, including 2 undergraduates and 22 failed, including 9 undergraduates. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Georgetown University	(1907)	76.5
Howard University, Washington, D. C.	(1907)	75
Yale University	(1908) 75; (1910)	80.2
Medical School of Maine	(1886) 75; (1898) 75; (1908)	75
Johns Hopkins University	(1903)	77.8
College of Physicians and Surgeons, Baltimore	(1909)	77.9
Harvard University Medical School	(1908) 84.2; (1909) 75, 75, 84.5; (1910) 75, 78.2, 79.4; (1911) 75, 76.1.	
Tufts College Medical School	(1906) 75.2; (1910) 75.2, 77, 77.5.	
College of Physicians and Surgeons, Boston	(1908) 75, 75; (1909) 75; (1910) 75.8.	
Dartmouth Medical School	(1909)	83.5
New York University Medical College	(1884)	80
Albany Medical College	(1910)	76
Columbia University, College of Physicians and Surgeons	(1908) 76.9; (1909) 83.2.	
Cornell University Medical College	(1910) 78.3, 78.6, 82.1.	
University of North Carolina	(1910)	76
University of Vermont	(1908) 77.1; (1909) 81; (1910)	75
McGill University, Canada	(1910)	79.3
University of London, England	(1905)	80.6
Undergraduates		75.6, 75.8
FAILED		
Kentucky University	(1904)	60.6
University of Maryland	(1909) 72.1; (1910)	69
Maryland Medical College	(1906)	69.9
Baltimore University	(1908)	71.8
Tufts College Medical School	(1910) 69.4, 71.3, 72.9.	
College of Phys. and Surgs., Boston	(1908) 64; (1910)	72.2
Harvard University Medical School	(1910)	72.7
University College of Medicine, Richmond	(1907)	68.2
University of Naples, Italy	(1909)	60.7
Undergraduates, 16.7, 32.5, 42.8, 50.5, 60.4, 69.7, 71.7, 71.8, 73.6.		

At the examination held in May, the total number of candidates examined was 31, of whom 19 passed, including 5 undergraduates, and 12 failed, including 2 osteopaths and 3 undergraduates. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
University of Maryland	(1909)	75
Tufts College Medical School	(1910) 75, 75, 75.8.	
Harvard University Medical School	(1908) 76.2; (1909) 80.2; (1910) 75.5, 80, 81.2.	
College of Phys. and Surgs., Boston	(1909) 75.7; (1910)	75
Dartmouth Medical School	(1910)	81.9
Columbia University, College of Phys. and Surgs.	(1905)	86.1
University of Helsingfors, Finland	(1907)	78
Undergraduates, 75, 75, 75.3, 77.1, 78.		
FAILED		
College of Physicians and Surgeons, Boston	(1908) 68.2, 69.5; (1909) 71.6; (1910) 70.6, 72.	
Columbia University College of Phys. and Surgs.	(1900)	70.7
University College of Medicine, Richmond	(1907)	72.2
Undergraduates, 68.5, 71.1, 72.3.		

Marriages

FRANCIS HAMILTON REDEWILL, M.D., Phoenix, Ariz., to Miss Helena Munn of Ann Arbor, Mich., in Paris, France, May 18.

FRANCIS MARION MURRAY, M.D., Delaware, O., to Miss Jessie Gertrude Browning of Columbus, O., May 24.

EDMUND E. RYAN, M.D., Ashland, Wis., to Mrs. Amy Carlin Shores of Welcome, Wis., at Ripon, June 5.

HERBERT EDWARD WHEELER, M.D., to Miss Beulah Madailene Smith, both of Spokane, Wash., June 7.

JAMES ALLMOND DAY, M.D., Jacksonville, Ill., to Miss Frances E. Wilmot of Chicago, May 6.

GEORGE R. CARSON, M.D., San Francisco, to Miss Grace M. Northgraves of Chico, Cal., June 17.

ALFRED ROY WARNER, M.D., to Miss Anna Zeh Flansburg, both of Gallupville, N. Y., June 14.

HENRY SHERRY, M.D., Pasadena, Cal., to Miss Gertrude Paine of Redlands, Cal., June 22.

HARRY TAYLOR MARSHALL, M.D., to Miss Nancy Lee, both of Ivy, Va., June 9.

HENRY B. ERDHAUS, M.D., to Miss Louise Sebastian, both of St. Louis, March 15.

ELI A. MILLER, M.D., to Miss Ethel Block, both of Cincinnati, June 6.

Deaths

Carl Beck, M.D., a prominent surgeon of New York City; died at his summer home, Pelham Heights, N. Y., June 8, from pneumonia, aged 55. He was born at Neckargemuend, Germany; received his academic education at the universities of Heidelberg and Berlin, and his medical degree from the University of Jena in 1879. Three years later he came to the United States and soon became prominent as a specialist in surgery. He was a member of the American Medical Association, Society of Medical Jurisprudence, New York Academy of Medicine, and had been president of the American Therapeutic Society and German Medical Society of New York. He was also an active, honorary and corresponding member of many scientific societies, both here and abroad. He was visiting surgeon and, at one time, president of St. Mark's Hospital and surgeon to the German Polyklinik, and professor of surgery at the New York Post-Graduate Medical School and Hospital. He was the author of several monographs on surgical subjects. He had been in failing health for several months and on that account had resigned the presidency of St. Mark's Hospital.

Charles Manly Ellis, M.D., of Elkton; one of the most widely known practitioners of Maryland; died in Johns Hopkins Hospital, Baltimore, June 3, several weeks after an operation for appendicitis, aged 73. He was born at Elkton; entered the University of Pennsylvania and graduated in 1861. During the Civil War Dr. Ellis served as assistant surgeon of the Sixth Pennsylvania Volunteer Cavalry (Rush's Lancers). He was taken prisoner and his devoted attention to the wounded soldiers of the Confederate Army won for him the esteem of the South. In 1863 Dr. Ellis resigned and returned to Elkton to take up practice. He was a member of the American Medical Association; a member and former president of the Medical and Chirurgical Faculty of Maryland; president of the Cecil County Medical Society; a director of the Union Hospital of Cecil County and, until his health failed, local surgeon of the Pennsylvania Railroad.

Thomas Davis Strong, M.D. University of Buffalo, N. Y., 1851; a member of the American Medical Association; in 1894 president of the New York State Medical Association, and formerly president of the Chautauqua County and Fourth District Medical Associations; a member of the American Academy of Medicine; for twenty-five years curator of the medical department of the University of Buffalo; surgeon of the Sixty-Eighth New York Volunteer Infantry throughout the Civil War; one of the commissioners who located the present state hospital, Buffalo; died at his home in Westfield, June 6, aged 88.

Charles Henry Dixon, M.D. Missouri Medical College, St. Louis, 1878; of St. Louis; a member of the American Medical Association, Association of Military Surgeons of the United States, and St. Louis Obstetrical and Gynecological Society; clinical lecturer on surgery and professor of rectal surgery of the medical department in Washington University; consulting surgeon and chief of staff to Bethesda, and surgeon to the St. Louis City and St. Louis Female hospitals; died at his home, June 5, from carcinoma of the liver, aged 55.

John Quincy Adams, M.D. New York University, New York City, 1853; of Los Angeles; surgeon of the One Hundred and Seventy-Second New York Volunteer Infantry during the Civil War; who, while a resident of Pasadena, presented his medical library of 700 volumes to the public library of that city; died at the Good Samaritan Hospital, Los Angeles, May 23, aged 84.

Michael Thomas Pendergast, M.D. University of Pennsylvania, Philadelphia, 1882; of Philadelphia; a member of the Medical Society of the State of Pennsylvania; consulting physician to St. Joseph's Hospital; a fellow of the College of Physicians of Philadelphia; died in Ocean City, N. J., June 3, from paralysis of the throat, aged 57.

Harris Howey, M.D. St. Louis Medical College, 1845; a physician of Louisa County, Ia., since 1841; one of the California Argonauts; surgeon of the Twentieth Iowa Volunteer Infantry during the Civil War; for several years a member of the local pension board; United States gauger in 1873 and 1874; died at his home in Wapello, May 13, from senile debility, aged 94.

William Edgar Lindley, M.D. Cooper Medical College, San Francisco, 1885; of Miami, Ariz.; a surgeon of Arizona Volunteers during the Spanish-American War; formerly demonstrator of anatomy in the medical college of the University of Southern California, Los Angeles; died in Globe, Ariz., Nov. 20, 1910, from rheumatism, aged 48.

Julian E. Wood, M.D. Washington University, Baltimore, Md., 1869; for many years acting assistant surgeon U. S. P. H. and M.-H. Service, and surgeon of the Norfolk & Southern Railroad; health officer of Pasquotank County, N. C.; died at his home in Elizabeth City, June 1, aged 66.

Frederick Lemuel June, M.D. University of Buffalo (N. Y.), 1876; a member of the American Medical Association; for several terms coroner of Orleans County, N. Y., and for ten years postmaster of Waterport; died at his home in that village, June 6, from heart disease, aged 56.

Edwin Ray Humiston, Jr., M.D. University of Minnesota, Minneapolis, 1903; a member of the American Medical Association; for several years a member of the Minnesota State Board of Pharmacy; died at his home in Worthington, Minn., May 10, from lobar pneumonia, aged 43.

Henry Humphries (license, Twenty-Seventh Judicial District Board, Texas, 1896); for several years a member of the Santa Fe System hospital force with headquarters in Temple; later physician of the State Convict Camp, Bonus; died at the home of his sister in Temple, June 4.

William Smeltzer Derrick, M.D. College of Physicians and Surgeons, Atlanta, Ga., 1908; a member of the Mississippi State Medical Association and president of the Holmes County Medical Society; died at his home in Goodman, May 27, from typhoid fever, aged 28.

Henry Conant Prentiss, M.D. Berkshire Medical College, Pittsfield, Mass., 1857; for forty-five years an employee of the Massachusetts State Board of Health, Lunacy and Charity; died at his home in Somerville, May 26, from heart disease, aged 79.

Joseph J. Selbach, M.D. College of Physicians and Surgeons, Chicago, 1888; of Eau Claire, Wis.; formerly secretary and treasurer of the Intercounty Medical Society; died in the Sacred Heart Hospital in Eau Claire, May 25, from heart disease, aged 46.

Paul L. Bellenger, M.D. Memphis (Tenn.) Hospital Medical College, 1896; a member of the Louisiana State Medical Society; of Lake St. John; died near that place from the effects of gun-shot wounds received in an altercation with a tenant, aged 42.

Edmund Montgomery, M.D. University of Würzburg, Germany, 185—; for six years a practitioner in Madeira, Mentone and Rome; since 1873 a resident of Hempstead, Tex.; died at his home near Hempstead, April 17, from paralysis, aged 75.

Austin B. Chamberlin, M.D. University of Nashville (Tenn.) 1869; of Galveston; secretary-general of the Supreme Council of the Southern Jurisdiction of Scottish Rite Masons; died in Washington, D. C., June 7, from cerebral hemorrhage.

William T. Rose, a practitioner of Wichita, Kan. in the early seventies; a veteran of the Mexican and Civil Wars; coroner of Sedgwick County from 1885 to 1887; died at the home of his daughter in Wichita, May 28, aged 90.

William Henry Bertram, M.D. College of Physicians and Surgeons, Boston, 1891; Tufts College Medical School, Boston, 1895; of East Boston; died in the East Boston Relief Station, June 4, from cerebral hemorrhage, aged 61.

David W. Thompson, M.D. Eclectic Medical University, Kansas City, 1902; of Kansas City, Kan.; a member of the Kansas Medical Society; died in Seattle, Wash., January 12, from endothelioma of the cerebrum, aged 53.

William Henderson Nickles, M.D. Ohio-Miami Medical College, Cincinnati, 1910; an intern in the Cincinnati City Hospital; died in that institution, May 29, six days after an operation for appendicitis, aged 23.

Alfred Thorley Hamilton, assistant surgeon of the 148th Pennsylvania Volunteer Infantry during the Civil War, and health officer of Lewistown, Pa.; died at his home, May 9, from chronic nephritis, aged 75.

George Hazard Perry, M.D. New York Medical College, New York City, 1865; a member of the Riley County (Kan.) Medical Association; died at his home in Manhattan, April 20, from senile debility, aged 81.

Bolivar Antrobus, M.D. Medical College of Cincinnati, 1876; a veteran of the Civil War; coroner of Mitchell County, Kan., from 1890 to 1892; died at his home in Beloit, June 3, from pneumonia, aged 75.

Orlando M. Edwards, M.D. Medical College of Ohio, Cincinnati, 1859; a member of the Neosho County (Kan.) Medical Society; died at his home in Chanute, April 26, from heart disease, aged 74.

Benjamin F. Stultz, M.D. College of Physicians and Surgeons, Keokuk, Ia., 1888; a member of the American Medical Association; died at his home in Moweaqua, Ill., May 24, from nephritis, aged 56.

Oliver Broadbent, M.D. Cincinnati College of Medicine and Surgery, 1868; for forty years a resident of Madison County, Ind.; died at his home near Anderson, June 3, from heart disease, aged 69.

William A. Reid, M.D. University of Louisville (Ky.), 1890; of Muskogee, Okla.; was instantly killed in a collision between his automobile and a Frisco passenger train near Muskogee, May 11, aged 41.

David Lewis Walmsley, M.D. University of the Victoria College, Coburg, Ont., 1866; of Detroit; formerly a member of the American Medical Association; died, January 22, aged 69.

Henry M. Fowler (license, Illinois); a practitioner for forty-five years; for several years postmaster of Scales Mound, Ill.; was found dead in his room in that place, June 2, aged 77.

Allen H. Galloway, M.D. Tulane University, New Orleans, 1874; a member of the State Medical Association of Texas; died at his home in Laneville, June 4, aged 61.

Alexander Bethune, M.D. Queen's University, Kingston, Ont., 1858; a member of the Ontario Medical Council from 1869 to 1880; died at Emo, Ont., April 8, aged 77.

John Thompson Biggs (license, Indiana); who retired from active practice in 1884; died at his home in Mitchell, May 16, from valvular heart disease, aged 86.

Edward Galbraith Darling, M.D. University of Maryland, Baltimore, 1882; died at his home in Lauraville, Md., June 6, from pulmonary tuberculosis, aged 52.

Julius Patterson Trotti, M.D. Atlanta (Ga.) College of Physicians and Surgeons, 1910; died at his home in Atlanta, May 9, from heart disease, aged 23.

Walter T. Sanders, M.D. Medical College of Georgia, Augusta, 1886; of Bluffton, S. C.; died in a hospital in Savannah, Ga., May 26, from paralysis.

Homer Lee Woldridge, M.D. Washington University, St. Louis, 1901; died at his home in Breckenridge, Mo., May 27, from tuberculosis, aged 33.

Richard Daniel King, M.D. University of Nashville (Tenn.) 1853; died at his home in Whiteright, Texas, April 22, from senile debility, aged 83.

Charles J. Foscue, M.D. Medical College of Alabama, Mobile, 1900; died at his home in Walnut Springs, Tex., June 5, aged 35.

William Wallace Holloway (license Tenn., 1889); died at his home in Union City, February 5, from pneumonia, aged 69.

David F. Knott, M.D. Southern Medical College, Atlanta, Ga., 1883; died at his home in Carrollton, Ga., May 12.

Stephen E. Hazen (license, Vermont, 1896); died at his home in East Wallingford, May 5, aged 68.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

CONVICTIONS UNDER THE FOOD AND DRUGS ACT

The government officials continue to bring to task those exploiters of drugs that are guilty of adulterating or misbranding their products. We have, at different times, given brief abstracts of the Notices of Judgments which the government issues in all cases of convictions under the Food and Drugs Act. A few more of the latest violations of this law are here appended.

Some of these decisions take on an added interest in view of the fact that the Supreme Court of the United States has recently so interpreted the Food and Drugs Act as greatly to limit its scope. The court holds that the law does not apply to statements, false or otherwise, regarding the curative effects of medicinal preparations but that it governs only misstatements regarding composition or place of manufacture.

Under the new interpretation it is a question whether the government could again—on the same grounds—secure a conviction of the exploiters of Londonderry Lithia Water, for instance. This water, as the Notice of Judgment makes clear, contains such an infinitesimal quantity of lithia as to be absolutely valueless for producing any of the therapeutic effects of lithium. The officials entrusted with the enforcement of the pure food law held that a water containing an amount of lithium so small as to be therapeutically negligible was misbranded if it was called a "lithia water." Probably under the new interpretation, the exploiters of this pseudo-lithia water could operate unmolested.

In the case of the "California Waters of Life," there is no question that under the new interpretation of the law no conviction could be secured. "California Waters of Life" is simply ordinary spring water; no more, no less. Yet it has been advertised as a cure for nearly every disease in the calendar. As it is not a cure, a conviction was obtained—but this was before the Supreme Court had limited the meaning of the law. The case against "Hair's Asthma Cure" would also have fallen to the ground had the Supreme Court's decision been rendered earlier.

LONDONDERRY LITHIA WATER

This product was sent out by the Londonderry Lithia Spring Water Company, Nashua, N. H., and was recommended "for Rheumatism, Neuralgia, Dyspepsia, Eczema, Malarial Poisoning, Gout, Gravel, Bright's Disease, Diabetes, Dropsy and all diseases of the Kidneys and Bladder." While labeled a "lithia water," the government chemists found it to contain "only a faint spectroscopic trace, insufficient to give a therapeutic action of lithia when a reasonable quantity of the water was consumed." The attorneys for the government claimed that the product was misbranded in that, while it was sold as a "lithia water" it "did not contain any appreciable amount of lithium and was not a lithia water."

The government chemists found that the amount of lithium in 4 quarts of this water was so small as to be unweighable. As chemical balances will register weights as small as 1/1200 of a grain, there was evidently less than that amount of lithium in 4 quarts. The average therapeutic dose of the salt of lithium said to be in this water is 6 grains. A person who wished to get one average dose of lithium, therefore, would have to consume, at the very lowest estimate, more than 225 barrels of Londonderry lithia water.

The government analysts also found in some of the samples examined that sodium chlorid (common salt) and sodium bicarbonate had been added to the water. As the presence of neither of these added substances was mentioned on the label and as the purchaser would believe that he was getting a natural water, the addition of these two substances was deemed misbranding. The product was condemned and for-

feited and the United States marshal was ordered to destroy it. The cost of the proceedings was assessed on the company. [*Notice of Judgment No. 822.*]

KICKAPOO COUGH CURE

This nostrum was shipped in interstate commerce by the Kickapoo Indian Medicine Co., Clintonville, Conn. Samples of the shipment were analyzed by the government chemists and found to be a "solution of sugar, glycerin, vegetable extractive, aromatic bodies, inorganic salts and undetermined matter" in water and alcohol. The stuff was declared misbranded, first, because although it contained a certain percentage of alcohol, the package or bottle failed to bear a statement on the label to that effect; second, in that while it was labeled a "cough cure," it was not a cough cure, and, third, in that while it was claimed to possess properties recognized by the medical profession as necessary to the proper treatment of diseases of the lungs, it did not, in fact, possess such properties. A fine of $25.00 and costs was imposed. [*Notice of Judgment No. 826.*]

CALIFORNIA WATERS OF LIFE

This impudent fake was shown up by Mr. Adams in the "Great American Fraud." After a period of retirement it is, apparently, again being brought to the attention of the gullible. Several hundred bottles of this stuff were shipped by N. C. and E. J. Foster of La Pressa, Cal., to Tennessee. The labels bore the following statements:

"Original California Waters of Life, formerly known as Isham's Sweet Water Springs, San Miguel Mts., San Diego, Calif. The most salubrious spot on earth. Just as it flows from nature's laboratory. Famous for its miraculous power to destroy diseases and actually rejuvenates humanity by dissolving and evacuating calcareous old age matter and microbes. The worst form of kidney, stomach, blood and skin diseases yield to its marvelous power. Cures rheumatism, Bright's disease, diabetes, gallstones, acute dyspepsia, insomnia, and gives new life. Makes the blood pure and postpones old age. No other water performs such wonderful cures. Requires less than one-half the amount of other medicinal waters to derive the desired results. Some physicians have requested that the precipitation, if any occurs, be saved for their own use as it is pronounced by chemists to be iron and silica and in no manner is the value of the water lessened or deteriorated."

Samples of the product were analyzed by the government chemists and the "California Waters of Life" was found to contain no ingredients beyond those found in ordinary spring water. The government attorneys insisted that the stuff was misbranded under the Food and Drugs Act and the courts, of course, upheld their contention. [*Notice of Judgment No. 830.*]

"TEMPERINE," "DOCTOR FIZZ," AND "CREAM ALE"

These three products were alleged to be temperance drinks and were shipped from Paducah, Ky., to Tennessee by one H. Friedman, who does business as A. M. Laevison & Co. These products were labeled respectively:

"Drink Laevison's Temperine Special Brew. The great Temperance Drink; Guaranteed under the Food and Drugs Act non-intoxicating. A. M. Laevison & Co., Paducah, Ky."

"The Great Temperance Beer, Laevison's Original Doctor Fizz Special Brew; Guaranteed by A. M. Laevison & Co., Paducah, Ky., under the Food and Drugs Act, June 30, 1906."

"The Great Temperance Beer, Laevison's Original Cream Ale Special Brew; Guaranteed by A. M. Laevison & Co., Paducah, Ky., under the Food and Drugs Act, June 30, 1906."

Samples were analyzed in the Bureau of Chemistry and each was found to contain approximately 4 per cent. of alcohol. As ordinary beer contains about the same amount of alcohol, the government officials declared these "temperance" drinks misbranded. In the case of the "Cream Ale" it was declared to be not only misbranded but adulterated in that fermented beer had been substituted in part for the "cream ale." The defendant pleaded not guilty to the charges, but the jury disagreed with him and he was fined $50 and costs. [*Notice of Judgment No. 834.*]

HAIR'S ASTHMA CURE

This nostrum was shipped by Margaretta R. Cochran and Westanna McClelland—who are known to the public as Dr. R. W. Hair—and by Robert Cochran, their agent and manager from their headquarters at Hamilton, O., to the District of Columbia. It was labeled and sold as a cure for asthma. Analyzed by government chemists, it was found to contain:

Alcohol	Glycerin
Potassium iodid	Water

As such a mixture is not a cure for asthma, the product was declared misbranded. A plea of guilty was entered and a fine imposed. [*Notice of Judgment No. 837.*]

BRUNNER'S GREASELESS PEROXID CREAM

John Brunner and Fred T. Barrett, who do business as the Peroxid Specialty Co., shipped from their headquarters at Cincinnati, O., into Indiana, a drug product labeled in part as follows:

"Brunner's Greaseless Peroxid Cream."

"An ideal bleach for the skin."

"Brunner's Peroxid Cream produces a rich white skin and a complexion admirably fair."

"There is nothing more beneficial to the skin where blemishes or impurities exist than peroxid of hydrogen."

"Only the purest and best of this product is used in making Brunner's Peroxid Cream."

The stuff was analyzed by the government chemists and while, borax, glycerin and spermaceti were found, no peroxid could be discovered. As the purchaser would doubtless believe that in purchasing "peroxid cream" he was getting something containing peroxid of hydrogen, the absence of this substance from Brunner's preparation was deemed misbranding. A plea of guilty was entered and a fine imposed. [*Notice of Judgment No. 840.*]

GERMAN SEIDLITZ SALTS

This stuff was made by the American Granule and Tablet Co. of Cincinnati, O., and was sold under the following claims:

"Promotes longevity, strengthens the nerves, cures headache after over-indulgence."

"Purifies and decarbonizes the blood."

"Cures chronic and sick headache."

"Genuine Seidlitz must not be confounded with Seidlitz powders."

"The salt is the same as the salts from Seidlitz Springs, Germany."

"Cures hemorrhoids, constipation, bad breath, weak stomach . . ."

"Positively prevents appendicitis, varicocele, apoplexy, tendency to paralysis."

"Old age can be attained by taking small doses daily."

When analyzed by the government chemists, the product was found to contain the following composition:

Sulphur trioxid	41.49
Magnesium oxid	21.18
Water	37.22

As the label and the statements on the label were evidently intended to give the impression that this drug was of German origin and was derived from the Seidlitz Springs in Bohemia, it was declared misbranded for, as a matter of fact, it was manufactured in Cincinnati. The falseness of the therapeutic claims also constituted misbranding. The defendant pleaded guilty and was fined. [*Notice of Judgment No. 843.*]

EGYPTIAN DEODORIZER AND GERM KILLER

This was sold by the Paul Manufacturing Co., of Boston, Mass., as a "perfect fumigator and destroyer of disease germs." When analyzed it was found to consist of wood, apparently cedar, perfumed with essential oils. Experiment showed that the burning of this "germ killer" in a small, closed room did not kill germs after four hours exposure. The stuff was declared misbranded and a fine imposed. [*Notice of Judgment No. 856.*]

PAINEASE

The Jordan Company, which is the style under which Louis W. Jordan does business in Boston, sold a product called Painease. Some of the virtues assigned to this nostrum were:

"Stops all pain such as rheumatism, neuralgia, periodicals, backache, headache, etc., in fact it is for aches and pains of every description."

"It is a sure and very effective remedy for excessive dissipation of any kind."

"Contains no poisonous drug or opiate of any nature."

As this nostrum *would not* stop all pains and as it was *not* a sure, safe and effective remedy for excessive dissipation of any kind and as, further, it *did* contain a poisonous drug, namely, acetanilid (5 grains in each powder), Painease was declared misbranded. The defendant pleaded guilty. [*Notice of Judgment No. 860.*]

PHILLIPS' FACE LOTION

Phillips' Face Lotion was shipped by the Phillips Medical Company, Omaha, Neb., into Colorado. It was labeled in part as follows:

"A radical cure for any or all diseases of the skin."
"Restores it to its natural condition."
"Imparts a feeling of freshness."
"Cures Pimples, Blackheads, Barber's Itch, Eczema and any itching or burning of the Skin."

Analysis showed it to contain:

Methyl (wood) alcohol..	11.2	per cent.
Ethyl (grain) alcohol...	38.56	per cent.
Ash	0.03	per cent.
Resins, etc.	1.17	per cent.
Water	49.04	per cent.

The claims for curative effects made for this preparation being falsehoods and the fact that the amount of alcohol it contained was not correctly given on the label, caused the government officials to declare it misbranded. Under the Food and Drugs Act as it now stands, unfortunately, no cognizance can be taken of the fact that this preparation contained so dangerous a product as wood alcohol. A plea of guilty was entered and a fine imposed. [*Notice of Judgment No. 862.*]

H. H. H. MEDICINE

"D. Dodge Tomlinson's Celebrated H. H. H. Medicine" was the name of a nostrum shipped from Philadelphia into the District of Columbia. The number of diseases that this "celebrated" medicine was said to cure was remarkable. Not only would sprains, bruises, headache, toothache, rheumatism, neuralgia, sore throat, cholera morbus and cramps yield to its power, but spavins, windgalls, sweeny, contracted hoof, ringbone and poll-evil would disappear like magic. Analyzed by the government chemists, the product was found to be "a dark-colored liquid containing 52.30 per cent. of alcohol by volume, free ammonia, ammonium salts, camphor, salicylic acid, iodin in combination, soap and alkaloid-bearing drug extractives resembling cinchona, volatile oils and water." The labels on the bottles of this stuff stated that it contained 68 per cent. of alcohol; in the circulars that accompanied it, it was said to contain 57 per cent. of alcohol; as a matter of fact it contained only 52.30 per cent. of alcohol. According to the label, also, "it is entirely vegetable;" according to the government analysis, it is not. As the claims for therapeutic effects were false and the claims for the composition also were false, "D. Dodge Tomlinson's Celebrated H. H. H. Medicine" was declared misbranded. A plea of guilty was entered and a fine imposed. [*Notice of Judgment No. 863.*]

Morbidness and Its Relation to Disease.—Morbidness is primarily an overflow of energy; senility a loss of vital power. The one leads to disease, the other to decay. They are both found in abnormal persons, because an overflow of energy in one direction leads to its diminution in others. The marks of the two, however, are so distinct that they can be readily separated and studied. Of the two, morbidness is more closely allied to defective heredity, and hence the stigmata of the two are practically the same. Defective heredity is the more deep-seated; the morbidness of overnutrition shows itself in a stunted development of the higher faculties. Its cause is an arresting of the normal diversion of surplus energy from the lower to the higher organs. Morbidness ends in disease when the local surplus becomes unmanageable; it creates mental abnormalities through indirect effects on the higher powers. Disease, hysteria and insanity are its most pronounced manifestations; but it has so many minor symptoms that its abnormal effects cannot be related to their cause without the most careful study. (From Patten's "The Social Basis of Religion," New York, 1911.)

Correspondence

Sanitary Features of the Maneuver Camp at San Antonio

To the Editor:—Since President Taft has given prominence to the excellent health report of the maneuver camp (here at San Antonio, Texas, where I am at present), the reasons for it have been sought. The antityphoid inoculation undoubtedly stands preeminent. This is given in three inoculations, ten days apart; 0.5 c.c. the first time and 1 c.c. at each succeeding dose.

The results have been marvelous. Never in the history of the world has a military camp been so free from typhoid fever—only a civilian teamster and a mild case in a recruit, both incurred before reaching here. The reaction from the inoculation is nominal; merely a sore arm as though one had been vaccinated and it was taking.

The other contributory causes for the excellent health have been the pure water, the intense sunshine and the elimination of flies. The latter was the hardest problem of all, but was solved by Colonel Birmingham, the chief surgeon, by destroying the larvæ of the flies, burning off the picket lines with hay and oil once per week, the daily burning out of the latrines with crude oil and hay, the use of fly-proof box-seats to the latrines and the discontinuance of the old garbage-cans. Immediately in the rear of each kitchen an open incinerator was built, according to plans furnished by the medical department, by sinking a shallow trench which was filled up with small boulders and rock; this was banked on three sides by rock and the outside plastered with mud. Here a continuous fire from 6 a. m. to 7:30 p. m. consumes 23 cubic feet of solid garbage, and 100 gallons of liquid slops dripped along the sides for each one-sixteenth of a cord of wood consumed. Garbage is not allowed to stand, but is consumed at once as soon as produced. At some of the incinerators, as at Field Hospital No. 3, Major H. L. Gilchrist commanding, the heat of the burning garbage is utilized for boiling all the water used by the hospital, as well as for sterilizing the bedding and clothing of the patients. At the same hospital the kitchen is double-screened, a vestibule being screened at both ends so that if a fly enters it can be killed in transit without getting into the kitchen proper.

Though an average of over 12,000 troops have been encamped on the same ground for over three months, yet the sick report is about one-half what it was at their home stations. Of the eight deaths here but two have been from diseases developed here, both appendicitis of the fulminating type with general peritonitis. The remaining deaths were: two from drowning, one from pneumonia following measles, the patient dying before being brought into camp; one from cerebral hemorrhage following traumatism incurred before arriving; one from empyema, the patient being already sick on arrival here, and one case of chronic Bright's disease.

In an experience with military camps extending back to 1894 through the Spanish-American War, the Philippine insurrection and the Boxer rebellion in China, this is the first large maneuver camp that I have seen that can be called sanitary in the fullest sense of the word.

FRANK W. FOXWORTHY, Indianapolis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF HIP-JOINT DISEASE

To the Editor:—It is strange how two persons reasoning from the same facts can reach conclusions diametrically opposite. This apropos of Dr. Nutt's very interesting description of a case of adult hip-joint disease (THE JOURNAL, June 10, p. 1718). To one who studies his joints in the laboratory this case teaches, not the advisability of prolonging conservative treatment through many long, tedious years, but the absolute futility of conservative treatment of joint tuberculosis in the adult. Three "different surgeons, all excellent men of high standing," had attempted the impossible task for perhaps ten years, the fourth tires of it, the fifth now tries it again, and expects "that frequent examinations will determine a dis-

appearance of the signs." I venture the prediction that No. 5 will have as good success as the other four.

LEONARD W. ELY, Denver.

POSTGRADUATE STUDY ABROAD

To the Editor:—Can you give me any information in regard to visiting hospital clinics in Ireland, England, Germany, Italy and France? Where can I spend time with the most profit? If you can direct me to any sources of information it would greatly accommodate me. E. H. ROSS, St. Johnsbury, Vt.

ANSWER.—This subject was taken up at some length and detailed information was given for various countries in THE JOURNAL, April 8, 1911, p. 1056.

MOTHERSILL'S SEASICK REMEDY IN THE INDEX

To the Editor:—Will you kindly inform me if any report has been made by the Chemical Laboratory of the American Medical Association concerning "Mothersill's Seasick Remedy," which I have frequently had brought to my notice by patients returning from abroad. W. O. J., Indiana.

ANSWER.—Mothersill's Seasick Remedy was the subject of a contribution from the chemical laboratory that appeared in THE JOURNAL, July 2, 1910. This article is indexed both under the word "Mothersill" and under the word "Seasick," not only in the General Index but also in the Index to Current Medical Literature. We do not wish, in calling attention to this matter, to discourage our readers from writing to us for information. This we are always glad to supply. We receive so many inquiries of the character of the one just answered, however, that we feel it incumbent on us to remind our readers that they may often find a desired item of information more expeditiously by consulting the index of THE JOURNAL than by writing to us.

ABDOMINAL MASSAGE IN CONSTIPATION

To the Editor:—Please refer me to literature on abdominal massage for the cure of constipation. L. J., Arizona.

ANSWER.—We find the following references in which the title indicates that massage is one of the remedies discussed. There is a considerable number of other articles on the treatment of constipation, many of which undoubtedly consider the subject of massage, although it is not indicated by the title.

Teachnor, W.: The Mechanical Treatment of Habitual Constipation, *Ohio Med. Jour.*, 1908, vi, 268.
Juettner, O.: Physical Treatment of Constipation, *St. Louis Med. Rev.*, 1908, lvii, 187-190.
Gant, S. G.: Treatment of Mechanical Constipation and Obstipation, *New York Med. Jour.*, September, 1909.
Hazzard, T. L.: Abdominal Massage as a Means of Relief in Chronic Constipation, *Proctologist*, St. Louis, September, 1909.
Von Akerhielm: Local Massage of Rectum in Treatment of Habitual Constipation, *Therap. d. Gegenw.*, November, 1909.
Barnes, G. E.: Treatment for Chronic Constipation, THE JOURNAL, Dec. 25, 1909, p. 2161.
Dowse, T. S.: Mechano-Therapeutics for Constipation, *Practitioner*, May, 1910.

BACTERICIDAL EFFECTS OF ALCOHOL

To the Editor:—I note that in THE JOURNAL, June 10, page 1740, in reply to a query concerning the bactericidal effects of alcohol, you say that it would require several hours for 94 per cent. alcohol to kill pus-producing organisms, and that the stronger the alcohol the more efficient it is. May I call your attention in this connection to the experiments of Harrington and Walker (*Boston Med. and Surg. Jour.*, May 21, 1903), who found that 95 per cent. alcohol was no more bactericidal than 70 per cent., and in the absence of moisture was distinctly less efficacious. This conclusion is in accord with that of numerous other authors, for instance: Rideal ("Disinfection and Preservation of Food," third edition, page 322) quotes the experiments of Minervini, in which it was shown that with 70 per cent. alcohol the *Staphylococcus pyogenes aureus* was killed in ten minutes, but survived three days' exposure to 99 per cent. alcohol. Similar figures were obtained with other organisms. HORATIO C. WOOD, JR., Philadelphia.

To the Editor:—On page 1740 of THE JOURNAL, June 10, 1911, are statements indicating that the strongest solutions of alcohol have greater bactericidal effects than solutions of moderate strength, e. g., 60 per cent., and that the strong solutions are the most efficient bactericides both on the skin and in glass containers. This opinion differs from statements in our recent text-books and certainly is at variance with the following quotations from Harrington and Walker (*Boston Med. and Surg. Jour.*, cxlviii, 548-552, May 21, 1903):

"Against dry bacteria, absolute alcohol and ordinary commercial alcohol are wholly devoid of bactericidal power, even with twenty-four hours' direct contact, and other preparations of alcohol containing more than 70 per cent. by volume are weak in this regard, according to their content of alcohol—the stronger in alcohol, the weaker in action."

"The most effective dilutions of alcohol against the strongly resistant (non-sporing) bacteria, such as the pus organisms, in the dry state, are those containing from 60 to 70 per cent. by volume, which strengths are equally efficient against the same organisms in a moist condition."

"The stronger preparations of alcohol possess no advantage over 60 to 70 per cent. preparations, even when the bacteria are moist; therefore, and since they are inert against dry bacteria, they should not be employed at all as a means of securing an aseptic condition of the skin." W. A. SAWYER, Berkeley, Cal.

TREATMENT OF BROMIDROSIS

To the Editor:—Please give me some treatment for bromidrosis. Some time ago I saw an article in reference to the treatment of this condition and was under the impression it was in THE JOURNAL, but cannot find it. D. E. LITTLE, Eufaula, Okla.

ANSWER.—We find no references to this subject in recent current literature. The treatment should be the same as for hyperidrosis to check the sweating. Appropriate regulation of diet and treatment for general conditions should be instituted. Salicylic acid in 5-grain doses has been used internally with success. Locally the following may be used: Chromii trioxidum (40 parts in 500) or liquor formaldehydi (10 parts in 500) or potassium permanganate (1 to 3 parts in 500) or equal parts of salicylic acid and starch as a dusting powder. (See "Physicians' Manual of the Pharmacopeia and National Formulary," p. 180). Applications should be made twice daily, and should be followed by thorough dusting of the parts with boric acid, which also should be dredged on the stockings and into the shoes if the feet are the parts subject to the perspiration. Stockings may be soaked in a saturated solution of boric acid and dried. Radiotherapy is reported efficient.

LITERATURE ON FLIES

To the Editor:—Please inform me of any literature respecting the house-fly. V. F. MARSHALL, Appleton, Wis.

ANSWER.—Pamphlets for the instruction of the public regarding flies have been published and distributed by the state boards of health of California, District of Columbia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Mississippi, Montana, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Utah, Virginia, Washington and Wisconsin. Copies can be secured by writing the secretary of the State Board of Health of any of these states, addressing him at the capital city. Pamphlets and leaflets have also been issued by the Merchants' Association's Committee on Pollution of the Waters of New York, of which Edward Hatch, Jr., is chairman, and by the Anti-Fly Crusade of Detroit. Dr. S. J. Crumbine, secretary of the Kansas State Board of Health has been especially active in promoting this campaign. The Chicago Department of Health has also taken the subject up in its bulletin.

One of the most comprehensive surveys of the subject yet published is contained in "The House-Fly—Disease Carrier," by L. O. Howard, chief of the Bureau of Entomology, U. S. Department of Agriculture. The book is published by Frederick A. Stokes Company, New York; price, $1.60.

The following references to original articles appearing in THE JOURNAL and elsewhere will be found of special interest on various phases of the subject. The subjects of the articles given include flies of a few other species than *Musca domestica*.

Orton, S. T., and Dodd, W. L.: Transmission of Bacteria by Flies with Special Relation to an Epidemic of Bacillary Dysentery, *Boston Med. and Surg. Jour.*, Dec. 8, 1910; abstracted in THE JOURNAL, Dec. 24, 1910, p. 2267.
Pickles, E. P. A.: Bacteria Carried on the Appendages of the Domestic Fly, *New Orleans Med. and Surg. Jour.*, November, 1907; abstr. in THE JOURNAL, Jan. 4, 1908, p. 74.
Newstead, R.: The Habits, Life-Cycle and Breeding-Places of the Common House-Fly, *Ann. Trop. Med. and Parasitol.*, February, 1908; abstr. in THE JOURNAL, May 16, 1908, p. 1650.
Flexner, S., and Clark, P. F.: Contamination of the Fly with Poliomyelitis Virus, THE JOURNAL, June 10, 1911, p. 1717.
Gilbert, N. C., Chicago: Infection of Man by Dipterous Larvæ, *Arch. Int. Med.*, October, 1908, p. 226. (This article contains an especially full bibliography on myiasis.)
McCampbell, E. F., and Corper, H. J.: Myiasis Intestinalis Due to Infection with Three Species of Dipterous Larvæ, THE JOURNAL, Oct. 9, 1909, p. 1160.

The following articles may also be consulted:

The Contaminated Fly, Correspondence, THE JOURNAL, May 27, 1911, p. 1593.
Miller, R. T., Pittsburg, Pa.: Myiasis Dermatosa Due to the Ox-Warble Flies, THE JOURNAL, Dec. 3, 1910, p. 1978.
Pease, H. D.: Relation of Flies to the Transmission of Infectious Diseases, *Long Island Med. Jour.*, December, 1910.
Overton, F.: Eradication of the House-Fly, *Long Island Med. Jour.*, December, 1910.
Flies and Typhoid Fever, Editorial, THE JOURNAL, Nov. 19, 1910, p. 1812.
Gudger, E. W.: Yaws Transmitted by a Fly, *Science*, Nov. 4, 1910; abstr. in THE JOURNAL, Dec. 3, 1910, p. 1951.
Flies as Carriers of Disease, London Letter, THE JOURNAL, Oct. 15, 1910, p. 1390.
Abating the Fly Nuisance, Current Comment, THE JOURNAL, Aug. 20, 1910, p. 700.
Nicholson, J. L.: Myiasis, THE JOURNAL, May 21, 1910, p. 1686.
Earlier References to the Relation of Flies to Disease, THE JOURNAL, March 10, 1910, p. 982.

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Palmer, J. W.: Relation the House-Fly Bears to Typhoid and Other Infectious Diseases, *Atlanta Jour. Rec. Med.*, August, 1910.

Felt, E. P.: Methods of Controlling the House-Fly and Thus Preventing the Dissemination of Disease, New York *Med. Jour.*, April 2, 1910; abstr. in THE JOURNAL, April 16, 1910, p. 1335.

Nash, J. T. C.: Bacterial Contamination of Milk: the Connection Between Flies and Epidemic Diarrhea, *Lancet*, London, Dec. 5, 1909.

Dutton, W. F., Pittsburg, Pa.: Blue-Bottle Flies as Carriers of Infections, THE JOURNAL, Nov. 6, 1909, p. 1561.

Cleland, J. B.: Flies in Dissemination of Disease, *Australasian Med. Gaz.*, September, 1909.

Lincecum, A. L.: The Musca Domestica as a Carrier of Disease: The Improvement of Sanitary Conditions in Country Homes and Villages, *Texas State Jour. Med.*, September, 1909.

Coward, F. A., Columbia, S. C.: Musca Domestica: The Common House-Fly, *Jour. South Carolina Med. Assn.*, August, 1909.

The Fly and Typhoid Fever, Editorial, THE JOURNAL, Aug. 28, 1909, p. 720.

Hop Vines to Exclude Flies, Query and Minor Note, THE JOURNAL, July 10, 1909, p. 132.

Osmond, A. E.: The Fly—An Etiologic Factor in Intestinal Disease, *Lancet-Clinic*, April 10, 1909.

Klein, E.: Flies as Carriers of the Bacillus Typhosus, *British Med. Jour.*, Oct. 17, 1908.

Smith, T.: The House-Fly as an Agent in the Dissemination of Infectious Diseases, *Am. Jour. Pub. Hyg.*, August, 1908; abstr. in THE JOURNAL, Sept. 26, 1908, p. 1108.

Robertson, A.: Flies as Carriers of Contagion in Yaws, *Jour. Trop. Med. and Hyg.*, July 15, 1908; abstr. in THE JOURNAL, Aug. 22, 1908, p. 712.

Efficient Means to Exterminate Flies (Queries and Minor Notes), THE JOURNAL, April 18, 1908, p. 1288.

Flies and Intestinal Disease, Editorial, THE JOURNAL, Jan. 18, 1908, p. 210.

Yount, C. E., and Sudler, M. T.: Human Myiasis from the Screw-Worm Fly, THE JOURNAL, Dec. 7, 1907, p. 1912.

Spoon, A. A.: Infection with Fly Larvæ, THE JOURNAL, Nov. 23, 1907, p. 1775.

Buchanan, R. M.: Carriage of Infection by Flies, *Lancet*, London, July 27, 1907; abstr. in THE JOURNAL, Aug. 24, 1907, p. 721.

LEGAL DEFINITION OF THE PRACTICE OF MEDICINE

To the Editor:—Please inform me if there has been given an authoritative judicial opinion as to the definition of the "practice of medicine." There has been much discussion on this subject in our county society

A. I. LAWBAUGH, Calumet, Mich.

ANSWER.—There are a great many supreme court decisions on this point, but they are mainly decisions interpreting the definition found in the medical practice act in force in the state at the time the decision was rendered. This question is one of the most important questions to be considered in framing a medical practice act.

There are two alternatives. One is to include no definition whatever in the law and to leave the courts to determine what is the practice of medicine in accordance with common usage, standard dictionaries, etc. The other is to include a definition of the practice of medicine in the law and thus make the definition a part of the statute. This, of course, has the advantage of being explicit; but, on the other hand, if the definition is a part of the statute, then the courts will refuse to recognize anything as being the practice of medicine that is not included in the definition found in the law.

The laws in the different states vary greatly. There are also a great many supreme court decisions involving the definition of the practice of medicine, probably forty or fifty in all. These decisions, however, bear principally on the question whether a certain specific act on the part of a person accused of violating the medical practice act is or is not included in the definition. For instance, the law in Michigan makes the use of the letters "M.B." or "M.D." or of the title "Doctor" or "Dr.," or any other sign or appellation, prima facie evidence of practicing medicine and surgery within the meaning of the law. In Illinois the practice of medicine is defined as "treating or professing to treat, operating on or prescribing for, any physical ailment or any physical injury to or deformity of another person." Here the courts have held (People *v.* Lehr, 196 Ill. 361; 63 N. E. 725) that the sale of a device or mechanical appliance is not the practice of medicine. The supreme court has also held (People *v.* Smith, 208 Ill. 31; 69 N. E. 810) that the sale of spectacles for a visual defect is not the practice of medicine; that nursing an invalid is not the practice of medicine. (Oswald *v.* Nehls, 233 Ill. 438; 84 N. E. 619). On the other hand, the supreme court has held (People *v.* Gordon, 194 Ill. 560; 62 N. E. 858) that manipulation and rubbing is the practice of medicine. These examples might be multiplied indefinitely. Unfortunately, there is no uniformity on this point. For instance, in fifteen states the courts have held that osteopathy is the practice of medicine, while in twenty they have held that it is not.

These illustrations show that it is impossible for the courts to render an "authoritative" decision on this question, since the courts exist to interpret the laws which are enacted by the legislatures but cannot go beyond them. If the state legislature passes a medical practice act without a definition of the practice of medicine in it, then the courts can use their own discretion in deciding what is or what is not the practice of medicine; but if the legislature includes a definition in the law, then the courts must confine their decisions to an interpretation of such a definition; and naturally their decisions vary in accordance with the terms of the definition as it is found in the law. As we have something like forty-eight different state laws and as each one has a different definition of the practice of medicine, it will readily be seen that the decisions on this question are somewhat varied.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POST-GRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

OPTOMETRY BILL DEFEATED IN PENNSYLVANIA

The optometry bill introduced into the legislature in Pennsylvania has been indefinitely postponed by unanimous vote of the committee to which it was referred. In a letter to the Westmoreland County Medical Society, published in the bulletin of the society for June, Dr. James Thorington, chairman of the state committee on optometry, calls the attention of the physicians of Pennsylvania to the necessity of having more physicians to do refraction work: He says, "If physicians in certain counties do not prescribe glasses for their patients then the patients will naturally drift into the hands of the jeweler or optician. If one physician in each one thousand population in any community would take a postgraduate course in ophthalmology and have the assurance of other physicians in his town or city that they would refer their patients for refraction, then the . . . so-called optometry question would be solved and the eyesight of the citizens would be correctly cared for."

LEGISLATION IN ILLINOIS

Since the last notice regarding Illinois legislation appeared in this department, Governor Deneen has signed the bill appropriating $60,000 a year for the medical department of the University of Illinois. By this act the College of Physicians and Surgeons of Chicago becomes the medical department of the state university. The law also provides a fixed rate of taxation for university purposes, thus making the University of Illinois, with its various departments, to a certain extent independent of the legislature, as the amount of the income for educational purposes is now definitely fixed by law.

Governor Deneen has vetoed House Bill 608, which provided for the appointment by local boards of education or school directors of one or more school nurses to have general oversight and supervision of the health of the pupils in public schools. This bill was introduced by Representative Carter of Champaign. In vetoing the bill, Governor Deneen says, "Under this measure the superintendency of the general health of pupils of public schools and the fitness of school buildings for occupancy may be placed in the hands of persons lacking knowledge of the anatomy of the human body and the conditions existing in disease and ignorant of the rudiments of sanitary science, as no qualifications whatever are required in the school nurses to be appointed. If these matters are to be entrusted by school directors to nurses it should be demanded at least that the nurses appointed should possess qualifications which will enable them to perform intelligently the duties with which they are charged as is required of school teachers."

While the intent of this bill may have been praiseworthy, the bill itself was open to many objections and its passage was opposed by the State Board of Health, which asked Governor Deneen to veto it. The bill was never approved by the physicians of the state and the action of the governor in vetoing it is entirely satisfactory to them.

Medicolegal

Admissibility in Malpractice Case of Evidence of Conveyance of Property to Wife—Damages Recoverable

The Appellate Court of Indiana, Division No. 1, in Harrod vs. Bisson (93 N. E. R. 1093), an action brought to recover damages alleged to have resulted from the negligent and unskilful manner in which the defendant reduced and treated the plaintiff's fractured and injured wrist and hand, where it affirms a judgment for $1,000 in the plaintiff's favor, holds that it was admissible to ask the defendant, on cross-examination, whether he conveyed his real estate to his wife after this action was brought or just before. The court says that, as an independent fact, this conveyance by the defendant of his real estate to his wife was foreign to any issue in the case, and it could be competent and material, if at all, but for one purpose, namely, it might disclose inculpatory facts and circumstances, or an admission by way of acts and conduct proper to be submitted to a jury, as tending to show that the defendant himself was conscious of having failed and neglected to treat the plaintiff's injured arm in that skilful and careful manner which the law required under such circumstances, and feared that he might be required to respond in damages on account of such neglect and lack of skill. The court assumes that it was on this theory that the court below admitted the evidence. The defendant testified in chief to his treatment of the broken arm, and in effect denied any act of omission or commission that in any way tended to show any lack of professional skill, care or attention, but said in effect that he did everything that a careful, attentive and skilful surgeon would have done under the same circumstances. This being the effect of his testimony, it was proper on cross-examination for the plaintiff to elicit from him any admission, by way of words or conduct, that tended to contradict, destroy, weaken or discredit his said evidence in chief, and the court thinks the evidence, or admission elicited by the question objected to, tended, in some degree, to have that effect, or at least was a question necessarily preliminary to other questions which might elicit answers having such tendency and effect, and that for that reason the evidence, if competent and proper at all, was proper in cross-examination. There seems to be some conflict in the authorities in different states as to the admissibility of this character of evidence, but the court thinks the weight of authority and the better reasoning of the same favors its admission. However, after this question and an affirmative answer, the defendant was entitled, on a redirect examination, to a full explanation and statement of all the facts and circumstances of the conveyance to the end that the jury might draw no improper inference from the admitted evidence. He also had the further protection that the law affords of defining the application and purpose of the admitted evidence by tendering an instruction on the same.

It was objected that an instruction authorized the jury to take into account, in estimating damages, the worry and annoyance of the plaintiff, on account of contemplation of her deformity. There was no doubt but that counsel were supported by the weight of authority in their contention that any annoyance, worry or mental pain resulting merely and solely from the contemplation of a deformed member of the body, and the humiliation of going through life in such a crippled condition, were too remote to be considered as elements of damage. On the other hand, it is well settled in Indiana that personal disfigurement or deformity resulting from negligent injury is a proper element to be considered in estimating damages, and such "anxiety and distress of mind as are fairly and reasonably the plain consequences of the injury complained of" are proper elements of damages. And it was entirely proper that the jury, in estimating the damages in this case, should take into account any personal deformity resulting to the plaintiff from her injuries, and it was proper also that they might consider any mental pain, suffering, "worry" or "anxiety" experienced by her in the actual use of the injured wrist and hand that was the direct result of the deformed condition. It was in this sense that the jury were authorized by the instruction to take into account such elements of "worry" and "anxiety," and not that the jury should consider any "anxiety" or "worry" resulting from the humiliation that came from the contemplation of the deformed condition.

What are Covered by Questions as to "Former Illnesses"—Tuberculous Laryngitis

The Supreme Court of Minnesota holds, in Gruber vs. German Roman Catholic Aid Association of Minnesota (129 N. W. R. 581), that a general question, in an application for life insurance, calling for information concerning "former illnesses" of the applicant, does not require the disclosure of an illness or ailment of a trifling, temporary or unimportant nature, but only those of a serious, dangerous or permanent character, although the rule no doubt is otherwise where the questions are specific.

The insured in this case in January, 1907, made an application for membership in the defendant association. His answer to the question: "Former illnesses and injuries?" was, "Small-pox in 1904. Complete recovery." But the evidence tended to show that during parts of the year 1905-06 he was treated by his physician for a throat trouble, the nature and character of which did not seem to have been disclosed to him. He was advised to make a change of climate, in the expectation that the difficulty would disappear. Acting on that advice, he went to Colorado in the spring of 1906, and remained there until August of that year, when he returned to his home in Minnesota, being pronounced cured, by the physician. He was about 24 years of age. In January, 1907, he made the application and answer therein stated above. In the fall of 1908, he was again taken ill, and died of tuberculous laryngitis in the spring of 1909. The association contended that the evidence was practically conclusive that he was suffering from that disease during the time of his treatment in 1905 and 1906, and that his failure to disclose it was fatal to his beneficiary's right to recover the insurance. Not so, however, is the legal decision.

In affirming a judgment in favor of the plaintiff beneficiary, the court holds that the jury were properly instructed that if the illness was of a serious, dangerous or permanent character, or of a nature continuous and not readily recovered from, it was the applicant's duty to make it known, and if he failed to do so no recovery could be had; but if the illness was merely temporary in its character, something that was unattended with any serious consequences, or from which serious consequences were not to be apprehended, something that passed away, from which he recovered and which was forgotten, the failure to disclose it would not avoid the contract. It is also held that the question whether the application in this case failed to disclose a prior serious or permanent illness was one of fact for the jury, and that the evidence sustained the verdict that it did not. Controlling effect was not to be given the advice of the physician. Suggestions that a change of climate would be beneficial are often made by physicians, when no serious ailment or disease is present. It was clear from the evidence that the man had no thought that he was suffering from a serious ailment, fully believed that his throat trouble had disappeared, and had apparently forgotten about it, while the physician also testified that the disease resulting in death might well have originated and come on after the man had become a member of the society.

Death from External Injury by Accidental Means—Susceptibility to Disease

The Supreme Court of Minnesota, in Ludwig vs. Preferred Accident Insurance Company (130 N. W. R. 5), affirms a judgment for the plaintiff for indemnity for the death of her husband, on a policy of accident insurance. It appeared that during the fifth or sixth inning in a game of baseball, in which the insured was engaged, he attempted to "steal second," and slid head foremost on his stomach the last nine or ten feet of the distance, stopping with his stomach over and on the second base, which consisted of a piece of a cement sidewalk paving block or slab, about 2 inches thick and 12

inches square, rough on one edge and smooth on the others. He indicated that he was hurt, and where; but continued to play until the end of the game. A day or two later he called a physician. His condition grew gradually worse, until he was taken to a hospital and operated on for appendicitis. His death was caused by septic peritonitis. The autopsy revealed a gangrenous condition of the appendix. Two enteroliths or concretions of the stony formation composed of a hardened fecal matter were found to be where the appendix was ruptured. His written application for insurance stated that he never had had physical infirmities or defects, and had not received medical or surgical attention within seven years immediately preceding. But it appeared that he had consulted a physician once or twice somewhat more than a year previous to his death; that the physician found some tenderness over the region of the appendix on pressure, and some soreness, and that he was suffering from a mild case of appendicitis, catarrhal in nature; that the physician prescribed a laxative, and never heard him complain after that.

The court holds that the evidence was sufficient to justify the jury in finding that the insured was injured by accidental means, and that the injury so received was the proximate cause of his death. It also holds that there was no reversible error in instructing the jury: "If you find that Ludwig had at some previous time suffered from an attack of appendicitis, and he had fully recovered therefrom, so that immediately before the external accidental injury at the ball game, if you find that there was such an injury received by him, there was then no appendicitis present, but because of such previous attacks Ludwig was more susceptible to the disease, and such an injury started it, there may be a recovery, although the external accidental injury would not have produced the appendicitis if his appendix had never been previously impaired by disease. . . . But if, because of the former attack, there was not merely a susceptibility to a further attack, but the actual disease itself existed, liable to be rendered active and virulent by Mr. Ludwig, in that event the active disease which resulted in death would not be regarded as the result of the fall alone, but as joint result of the fall and the latent disease, and there can be no recovery."

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Essentials to Conviction of Rape on Insane Person

The Supreme Court of Missouri, Division No. 2, says that in the rape case of State vs. Warren (134 S. W. R. 522) there was ample evidence to support a finding that at the time of the defendant's alleged act of intercourse with the prosecutrix she was so mentally deranged as to be incapable of understanding the moral nature of the act, or of giving assent thereto. To sustain the conviction, however, the state must go further, and give some evidence tending to show that the defendant knew of and took advantage of this mental infirmity of the prosecutrix, or that he intended to have carnal knowledge of her body by force, if necessary, and regardless of her consent. As to the latter proposition, there was no evidence that such was his intent. All that the defendant did was with her apparent assent and approval. Whether there was any testimony from which knowledge of her incapacity to consent could be imputed to the defendant was a question not free from difficulty. Reason and authority suggest the following principles as guides in the solution of this question: (1) Carnal intercourse with a woman incapable from mental infirmity of giving consent is rape, unless the man is ignorant of her infirmity and its extent, believes he has her consent, and has no intention to have intercourse without her consent. (2) Where the woman in point of fact yields an apparent assent to the act, the burden is on the state to prove that at the time of the act she was incapable, because of mental disease, of assenting to or dissenting from the act, and that the defendant knew of such incapacity. It was therefore error to instruct the jury that mere insanity of a character to be recognized by a person of ordinary intelligence was enough to convict. There were two objections to this instruction: (1) Mere insanity, even if known, does not make the act rape. The insanity must totally destroy the capacity to consent. (2) The defendant must know that there is no capacity to consent. This knowledge may be inferred from facts and circumstances in evidence, but the jury must find as an ultimate fact that the defendant did know.

Remedy for Refusal of License is Appeal, Not Mandamus

The Supreme Court of Washington says that it was conceded in State ex rel. Brunn vs. State Board of Medical Examiners (112 Pac. 746) that no appeal was taken from the order of the board refusing the relator a license, and the controlling questions before the court were whether the relator had a complete and adequate remedy by appeal from the order of the board, and, if he had, whether mandamus would lie to compel the issuance of a license. There could be no doubt but that the first question must be answered in the affirmative. The right of appeal was expressly granted by section 8399 of the Code, the same to be taken within thirty days after the filing of the decision of the board. Then, it is a well-established doctrine, repeatedly recognized and announced by this court, that mandamus will not lie in favor of a relator who has an adequate remedy at law, by appeal or otherwise. Section 8399 above mentioned provides for a trial *de novo* (anew), on appeal from the order of the board, and such a trial *de novo* would secure to a complaining party as complete an investigation and as adequate a remedy as could possibly be obtained in a mandamus proceeding. It is manifest that the relator was afforded an adequate remedy by appeal, had he sought the same within the statutory period. This being true, he would not obtain relief by mandamus. Nor does the court agree with the contention that because the time for appeal had expired, and no remedy by appeal remained to the relator, he should obtain a writ, he insisting that his license was illegally refused. The adequacy of his remedy by appeal could not be affected by his failure to avail himself of such remedy within the statutory period.

Consent Required for Delivery of Bodies to Medical Colleges

A trial term of the Supreme Court of New York, New York County, says, in Newman vs. Stewart (127 N. Y. S. 866), that, under section 2213 of the New York Law, dissection of a human body may be performed with the consent of the husband, wife, or next of kin. This is extended, by section 316 of the Public Health Law, so as to permit hospitals to deliver corpses to medical colleges with the assent of "relatives or friends." A reasonable construction of this provision is that the consent of relatives must be obtained if they can be found, and that reasonable inquiry must be made to find them. Only in case they cannot be found will the assent of "friends" suffice. The evidence in this case did not disclose what, if any, effort was made to discover the relatives of the deceased, beyond the fact that the name of a woman was entered as "friend" in the hospital records. Her consent was obtained, and the post-mortem examination made in reliance on it. This was not a compliance with the law.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Journal of Michigan State Medical Society, Battle Creek

June

1 Hospital Construction with a View to Economy in Maintenance. J. N. Holcomb, Grand Rapids.
2 Etiology of Anterior Poliomyelitis. T. Klingmann, Ann Arbor.
3 The Short Anesthetic, the Least and the Shortest Operation. B. Holmes, Chicago.
4 Genu Valgum, with Observations on Corrective Osteotomy. S. C. Graves, Grand Rapids.
5 *Diagnosis of Incipient Pulmonary Tuberculosis, with Special Reference to the Use of Tuberculin. T. D. Gordon, Grand Rapids.

5. **Tuberculin.**—Of forty-one patients, seen by Gordon, giving negative cutaneous tests, only one reacted to a subcutaneous injection, while of forty cases positive to the skin reaction thirty-six reacted to a subcutaneous injection; four were doubtful, due partly to the fact that it was not possible to

give subsequent injections. The patients who gave definite cutaneous reactions almost invariably proved very sensitive to subcutaneous injections. As an indication of sensitiveness to tuberculin, Gordon believes that the use of graded strengths of tuberculin applied by the technic of von Pirquet is as sensitive as any other test, and shows fairly well the cases that would react to the subcutaneous test. In view of the fact that a certain proportion of apparently healthy adults react to all the tests and that some of the worst cases fail to react, we should not allow any test of this sort to interfere with a careful history and examination of every case in which tuberculosis is suspected. Tuberculin alone cannot give a diagnosis A patient who fails to react to a series of tests carefully made with a good fresh preparation very probably does not have incipient tuberculosis. A patient who gives a reaction may have a latent or healed lesion, or the lesion which caused the reaction may be in a part of the body far remote from the disease which is causing the signs and symptoms of the patient's present trouble.

New York Medical Journal

June 3

6 Practical Treatment of Nervous People. J. J. MacPhee, New York.
7 *Tuberculosis of the Kidney in Women. H. N. Vineberg, New York.
8 Acute Hematogenous Infections of the Kidney and Pyelitis of Pregnancy; Their Medical Treatment. L. Louria, Brooklyn.
9 *Influence of Pregnancy on Diseases of the Eye. D. K. Shute, Washington, D. C.
10 *Immediate or Deferred Operation in Tubal Pregnancy? E. McDonald, New York.
11 *Relation of Uterine Myomata to Heart Disease. J. A. McGlinn, Philadelphia.
12 Acetone in Inoperable Cancer of the Uterus. A. Samuels, Baltimore.
13 Carcinoma of the Abdominal Wall in a Boy of 17 Years. J. P. Grant, New York.
14 *The "Liquor Bellostii" Test in Paresis. G. S. Amsden, White Plains, N. Y.

7. **Tuberculosis of the Kidney.**—According to Vineberg's observations, operative renal tuberculosis is more frequently met with in women than in men.

Renal tuberculosis in women is seldom or never associated with tuberculosis of the genital organs.

It is frequently overlooked in women and wrongly diagnosticated as catarrhal cystitis.

From the fact that it is oftener unilateral in women than in men, and that it is seldom or never associated in the former with genital tuberculosis, the prognosis of operative interference is much better in women than in men.

Nephrectomy for a tuberculous kidney in women is no bar to marriage or to bearing children.

9. **Pregnancy and Eye Diseases.**—Shute pleads for systematic and careful examination of the eyes of pregnant women by obstetricians with the view of safeguarding their vision and even their lives. He has found that albuminuric retinitis may exist for weeks, and even months, without pregnant women complaining of impairment of vision. The retinitis can exist for some time independently of, as well as in association with, symptoms of renal disease; also, independently of, as well as in association with, albuminuria. The presence of this retinal inflammation indicates a far advanced condition of the toxemia of pregnancy; or of that manifestation of the toxemia known as the kidney of pregnancy. The presence of this disease, in a larger number of cases than is realized, indicates a very grave prognosis as to the life of the patient, for the kidney of pregnancy may be followed by chronic interstitial nephritis. As long as the albuminuric retinitis lasts there is danger of vision being irretrievably ruined at any moment and in any month. The ophthalmoscope is the only means by which the earlier and relatively much less serious stages of toxemic retinal involvement can be detected. Also, it is the only means by which we may know that albuminuric retinitis even exists. Should the earlier stages of retinal involvement be detected, as they can, by the use of the ophthalmoscope, such remedial procedures can be adopted as may prevent the development of so sinister a disease as albuminuric retinitis; and, also, the necessity of inducing premature labor, in order to safeguard vision, may be obviated. When uranalyses are negative, the presence of pathological arterial tension and pathologic leukocytosis are invaluable symptoms of the toxemia of pregnancy. If increased arterial tension is persistent, as indicated by an abnormally accentuated second sound of the heart in association with a tense and wiry pulse, or as revealed by the sphygmomanometer, an ophthalmoscopic examination of the eyes ought by all means to be made at stated intervals.

10. **Operation in Tubal Pregnancy.**—The best treatment according to McDonald seems to be immediate operation without precipitation.

11. **Uterine Myomata and Heart Disease.**—From McGlinn's report a definite entity of a fibroid heart cannot be sustained. He found in a study of 113 post-mortem records of women dying with uterine myomata that such tumors occurring during middle and advanced life, are practically always associated with sclerotic heart lesions. These lesions are part of a general process and bear no relation to the fibroid. McGlinn is positive that many of the symptoms referable to the cardiovascular system found in fibroids are due to secondary anemia and occur just as frequently in anemia due to other causes. He notes that in fibroids there were found twelve normal hearts whereas in the cases without fibroids there were eighteen normal hearts. Again in the fibroid cases there were 195 lesions of the heart which were purely sclerotic in character and the same number of like lesions were found in the cases other than fibroids. These lesions expressed in percentage of the total lesions found were for the fibroids 80.9 and for the other cases 84.1.

While the total heart lesions in the fibroid cases were practically double those found in the non-fibroid ones, the normal hearts found in the latter exceeded the former by one. The sclerotic lesions found in the fibroid cases numbered fifty-one while those found in the non-fibroid cases were twenty-three. This would seem to show that fibroids did produce sclerotic changes in the cardiovascular system. This inference, however, is not justified, says McGlinn. He had no difficulty in collecting an equal number of cases, all under the age of 30 years, in which the total sclerotic lesions far outnumbered those found in the fibroid cases. Such a comparison would, he believes, be justified, as one must consider the fibroids selected cases as far as heart changes are concerned. In view of these considerations the verdict of not proved is a proper one.

14. **"Liquor Bellostii" Test in Paresis.**—Liquor Bellostii is prepared by dissolving mercury nitrate ($Hg_3(NO_3)_2$) in water slightly acidified with nitric acid. Pulverize 10 gm. of the salt in a mortar and very gradually add to this 80.6 c.c. of water to which 24 drops of a 25 per cent. solution of nitric acid has been added. If the acid water is not added slowly an insoluble precipitate results. The solution when right should be clear. The test is done as follows: To a few cubic centimeters of acid urine, which has been boiled, add 10 to 15 drops of liquor Bellostii. The urine is then boiled again two or three times. In negative cases there is a heavy white or chalky yellow precipitate formed; in positive results the precipitate is gray, almost black, and the supernatant fluid is yellowish. Of the urines thus examined by Amsden at Bloomingdale, thirty are included in the following note, of which fifteen were from cases of unquestioned paresis. The remaining fifteen control cases included the normal, paranoid, dementia præcox, manic depressive insanity and Bright's disease.

Of the paretics, four were positive, five so nearly negative that they were doubtful, and six frankly negative. Of the positive cases, three were clinically active; one stationary, bed ridden and entirely demented. In one of the active cases, two days before death, the reaction changed from doubtful to very positive. Of the doubtful cases, two were in the early stages of the disease and excited; the other three were in excellent states of remission and very intelligent. Of the negative cases, two were active and the others stationary, but decidedly demented.

Of the fifteen remaining cases, certainly not paretics, four were positive, three doubtful and eight negative. These results, says Amsden, need no comment as to the trustworthiness of

this test as a diagnostic measure, whatever value it may have from a metabolic standpoint.

Journal of Minnesota State Medical Association and Northwestern Lancet, Minneapolis

June 1

15 *Abnormal First Dorsal Rib Simulating Cervical Rib. J. Hvoslef, Minneapolis.
16 Polio-Encephalitis. E. King, Fulda.
17 Appendicitis with Complications. J. W. Little, Minneapolis.
18 Anatomic and Clinical Relationship of Nasal Accessory Sinuses to Diseases of the Eye. W. R. Murray, Minneapolis.
19 Hay Fever; Its Name and Nature. W. N. Porteous, Minneapolis.

15. **Abnormal First Dorsal Rib Simulating Cervical Rib.**—In Hvoslef's case a young man, employed in a railway freight office, complained of pain and disability of his left arm, which had commenced the previous summer. It was mainly the elbow that troubled him. He had a steady pain there, radiating to his forearm and hand. He also had some difficulty in extending his forearm, and complained of a tingling sensation in his fingers. The pain was almost steady, both night and day. He had also noticed that his left hand would become very cold and pale, almost white at different times. Otherwise he was in good health. On examination of the arm the elbow-joint was found normal, with the exception of a spasmodic contraction of the biceps muscle, preventing complete extension of the forearm. Some atrophy of the muscles of the forearm was also present. There was a bony prominence slightly above the clavicle, about at the junction of its inner and middle third. The skiagram showed that the abnormal rib was not a cervical rib, but an abnormally developed first dorsal rib, originating, as its normal mate on the other side, from the first dorsal vertebra and ending with a jointed attachment to the second rib. The end of the rib was found articulating with the inner upper surface of the second rib, and the cervical plexus rested on top of this joint which, with its capsule, formed the bulk of the prominence felt above the clavicle before the operation.

Boston Medical and Surgical Journal

June 8

20 *Classification of Diabetes Mellitus. A. E. Austin, Boston.
21 *Prognosis and Treatment of Tuberculosis of the Ankle in Adults. M. H. Rogers, Boston.
22 Problems of School Inspection. W. P. Coues, Boston.
23 *Tuberculous Meningitis with Leukocytosis and a Purulent Exudation Containing Many Bacilli. I. C. Walker, Boston.
24 The Public Health Laboratory. B. L. Arms, Boston.
25 Pregnancy as a Possible Relief for Visceral Ptosis. L. T. Brown, Boston.

20. **Diabetes Mellitus.**—From a number of instances of varied sugar metabolism studied by Austin, he thinks that a plus utilization indicates a hopeful outcome of the disease and though the patient may have to maintain a moderate deprivation of carbohydrate food for a long period, and possibly for life, yet after a time a diet in which sugar alone is eliminated may be possible. In a restricted diet, however, he says, too strong a warning cannot be given against the so-called gluten breads, which are always exploited as containing a large protein content, but nothing is ever stated in regard to the amount of starch contained, or at least the term "practically starch free" is used. If the amount of protein is worthy of being accurately stated in terms of per cent., certainly the starch is worthy of the same treatment and such breads could then be much more intelligently employed, for it would be easy to add the amount of carbohydrate ingested in this way to that taken in other ways, so that a basis for our calculation of utilization could be had. It has been Austin's experience in the use of every diabetic bread, but one, and that not particularly palatable, that even their restricted use causes an increased elimination of sugar when the utilization factor is 0, which can be determined either by the collection of the urine after twenty-four hours fasting or comparing elimination with the intake; three possibilities are always present, either that the tolerance will remain stationary, that it will increase, or that it may diminish. By complete removal of starch and sugar for a period during which the urine should be carefully watched for sugar and particularly for diacetic acid, we can soon determine in which direction the indications with reference to tolerance point and govern ourselves accordingly. If the utilization is minus and the body cannot even oxidize the amount of sugar that theoretically ought to be derived from proteid containing not more than 10 gm. of nitrogen daily, then tolerance has reached its lowest ebb and there is very little likelihood that restoration will take place. Such individuals usually die from steadily increasing acidosis.

21. **Tuberculosis of the Ankle in Adults.**—This paper is a study of the results in the treatment of tuberculosis of the ankle-joint in adults, and is based on the cases (23) at the Massachusetts General Hospital during the last seven years. From a study of these cases it is clear that fixation is not sufficient to control tuberculosis of the ankle-joint in adults in a large percentage of cases, and even in mild cases it requires a long period of time. Chronic invalidism, meaning by that a certain mental condition that these people are sure to reach, when they are of no use to society, should be avoided. This can be done by an early diagnosis, and by outlining the treatment so that the end-result is obtained within one or two years. Rogers holds that a complete operation, a radical removal of the focus, should be performed before there is much involvement of the various joint-surfaces, and it should not be undertaken only because fixation has failed. Better results can, undoubtedly, be obtained if this is done as soon as the diagnosis is established, and seems justifiable since fixation is not sufficient.

Amputation has been necessary in over 50 per cent. of these cases. Rogers would advise it when the process has invaded several joint-surfaces especially posterior to the astragalus. The results of amputation are good from the patient's point of view, and an artificial leg is preferable to long-continued dressings and sinuses. The length of time of treatment should be diminished to within two years.

23. **Tuberculous Meningitis with Leukocytosis.**—A young adult with physical signs of meningitis, fever and leukocytosis showed on lumbar puncture turbid spinal fluid, containing 98 per cent. of polymorphonuclear leukocytes and very many bacilli, with the morphologic and tinctorial peculiarities of the tubercle bacilli, yielding by animal inoculation the typical lesions of tuberculosis. The case is reported by Walker to emphasize the fallacy of diagnosing meningitis as due to pyogenic cocci from obtaining a turbid spinal fluid containing a large excess of polymorphonuclear leukocytes.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

Lancet, London

May 27

1 *Points of Clinical Interest Connected with the Exanthemata. S. Phillips.
2 *Fifty-Six Cases of Cleft Palate Treated by Operation. J. Ulrich.
3 *The Pressor Bases of the Urine. W. Bain.
4 *Nature of Connection Between Erythemata and Lesions of Joints. A. E. Garrod.
5 Salvarsan in Syphilis. G. Stopford-Taylor and R. W. Mackenna.
6 A Case of Spontaneous Fracture of the Leg Bones, Possibly Due to Mycotic Infection. E. W. H. Groves.
7 Acute or Paroxysmal Pulmonary Edema. A. E. Carver.
8 *A Case of Gastro-Enterostomy After Fifteen Years. R. Bevan.
9 Pneumothorax Complicating Bronchopneumonia in a Child Aged 2 Years. A. E. Sanderson.

1. **Exanthemata.**—The decrease in mortality of all the exanthemata in Great Britain is shown by Phillips to have been 73 per cent. in fifty-eight years. Of the individual diseases typhus has all but completely disappeared; small-pox occurs only occasionally as an epidemic, and is trivial in mortality as compared with that of by-gone years. As to scarlet fever, the mortality has fallen from 890 deaths annually per 1,000,000 persons living in the decade 1861-70 (1861 was the first year in which scarlet fever was classified by the registrar separately from diphtheria), to 80 deaths per 1,000,000 living in 1908—a decrease of 91 per cent. in forty-eight years. The deaths from measles per 1,000,000 living fell from 412 annually in the decade 1851-60, to 362

annually from 1901 to 1905. Measles is still, however, the most fatal of exanthems, causing three deaths to every one from scarlet fever, and to every two deaths from diphtheria; whooping-cough alone approaches it, causing 300 deaths to every 380 from measles. Since typhoid was first separated from typhus in the registrar's returns in 1870, the annual mortality from it has fallen from 390 per 1,000,000 persons living to 75 per 1,000,000 in 1908, a reduction of 80 per cent. Comparing the notifications of the disease with the number of deaths annually since the year 1890, the case fatality has fallen very little, if at all, from 16.9 per cent. to about 16 per cent. (it was 16.8 in 1908). It would, therefore, appear that the lessened number of deaths from typhoid is due in far greater degree to its lessened frequency of occurrence than to its lessened danger in individual cases.

2. **Cleft Palate.**—In the worst cases of cleft palate Ulrich operates, if necessary, on the alveolar process by the unilateral method with a Duplay's operation, by the double method after Bardeleben, and prefers to operate as early as possible. He operates subsequently for harelip at the age of from 4 to 6 months. The cleft in the palate will then, as a rule, diminish successively; but if it is, at the age of from 2 to 3 years, still very broad, he abandons the patient to the prothesis treatment. Ulrich thinks that there are cases in which a prudent squeezing of the jaws of the newly-born child will make the operation easier later. In the other cases, in which the cleft is narrower, he operates, if necessary, on the alveolar process also as soon as possible; on the harelip at the age of from 4 to 6 months, and for the cleft palate, he prefers Langenbeck's operation at the age of about 2 to 3 years, with a preference for the latter age.

3. **Pressor Bases of Urine.**—Pressor bases were found by Bain to be absent from the urine of children between 10 and 12 years of age, and apparently begin to be excreted about the age of 14. A vegetable diet considerably reduces the amount formed. Eggs and fish reduce the quantity to some extent, but if chicken is taken the amount is but little less than one obtains on an ordinary mixed diet containing butcher's meat. The bases are either absent or considerably diminished in cases of high blood-pressure. Doubtless the diminution in some cases is partially attributable to low dietary, but in most of the cases recorded in this paper the only possible explanation is that the bases are retained in the system and produce the rise in pressure. In gouty patients with normal blood-pressure the pressor bases are excreted in normal amounts.

4. **Erythemata and Joint Lesions.**—There is little doubt in Garrod's mind that erythematous and urticarial rashes are usually of toxic origin, as witness their development in some individuals after taking certain articles of diet or drugs, or as the results of stings of insects or of nettles, or of contact with caterpillars of certain species. One must suppose, therefore, that the lesions of joints which accompany them are likewise due to toxic influences working at a distance rather than to bacterial invasion of the articular structures.

8. **Gastro-Enterostomy.**—Commenting on his report, Bevan says it is pretty obvious that for at least the last five years the operation opening has more or less ceased to act, compelling food once more to find its way through the pyloric opening as best it could. Judging by the symptoms, although there has been more or less pain accompanying the passage of food through the pylorus into the duodenum, yet compared with the urgent symptoms in the pre-operated period of fifteen years before, digestion and nutrition were carried on with comparative ease and efficiency. This must by inference be due to some alteration in the capacity or patency of the pyloric orifice. No doubt, Bevan says, during the time that the operation orifice was patent, the lack of irritation allowed of the subsidence of a good deal of the inflammatory swelling, and, possibly, spasm around the sphincter. He suggests that possibly some alteration may have taken place in the character and situation of the original contraction scar. Again, in the vertical position, the shadow of the greater curvature in the stomach showed far below the umbilicus, and although peristalsis was seen it was ineffectual in reaching the pylorus. No adhesions were found at the subsequent operation.

Australasian Medical Gazette, Sydney

April

10 The Medical Profession in New South Wales. J. A. Dick.
11 Conductive and Spinal Anesthesia. C. MacLaurin.
12 *Endothelioma at the Base of the Brain, Producing Symptoms of Acromegaly. C. Reissmann.
13 *Bacteriology of Typhoid. H. Tebbutt.
14 Use of Thyroid Extract in Dementia Præcox. A. Danvers.
15 Outbreak of Arsenical Poisoning at an Isolated Farm Near Mullewa, Western Australia. J. H. L. Cumpston.

12. **Endothelioma at the Base of the Brain.**—The pituitary body with its stalk appeared to be healthy in this case, but the stalk arose from the lower surface of a large cystic swelling of grass-green color, which occupied the base of the brain and extended into the right optic thalamus. The swelling had almost completely severed the optic chiasma, and had thus caused blindness in the temporal field of vision. It bulged into the lateral ventricle and no doubt caused such great intraventricular tension that this led to the observed dementia. It pressed likewise on the lateral capsule, and thus gave rise to the spastic gait. Reissmann thinks that the circulation within the pituitary body was probably interfered with by the pressure of the cyst, and if so, the symptoms of acromegaly may have arisen from deficient internal secretion of the active principle of this gland. In the forward portion of the swelling, immediately in front of the pituitary body, was a hard nodule. In the transverse section of the brain this appeared to be a malignant growth. On microscopic examination the solid portion of the cyst was seen to be composed of round cells which clustered most densely round the small blood-vessels. There was no stroma. In many parts of a section it could clearly be seen that these round cells formed the actual walls of the small blood-vessels, from which it cannot be doubted that they arose. In some places the appearance presented was as if the capillary walls had been blasted and endothelial cells were scattered in all directions. The growth was, therefore, in Reissmann's opinion, an endothelioma. It contained much mucoid substance, some of which was structureless; in other parts it was confined within the bodies of cells, some of which it had distended to the point of bursting. The more solid part of the growth was arranged in circles or probably spheres, which carried the mucoid substance in the center. The growth may, therefore, be named a myxo-endothelioma annulare.

13. **Bacteriology of Typhoid.**—In all, fifty cases of enteric fever were examined by Tebbutt by the blood-culture method; thirty-six were positive, fourteen negative. In thirty-five the *B. typhosus* was found; in the remaining one an unidentified Gram-negative, feebly motile bacillus, with feeble fermenting properties. In a fifty-first case, Schottmuller's paratyphoid bacillus was found in both blood and urine. The average day on which both culture and Widal were done was the fourteenth day, and thus it is found in this series that, on an average, about 70 per cent. of cases still show bacilli in the blood-stream on the fourteenth day. Of course, the percentage is much higher in the first week of the disease (90 per cent. according to some writers). In only four cases were the bacilli found after the twenty-first day, and a bad prognosis may usually be given in these cases. Three of the four died, two from perforation and one from toxemia. In only one undoubted case were bacilli absent from the blood when the culture was made before the tenth day. This was a case which began very mildly, so that paratyphoid was suspected, the Widal developed slowly, but the temperature fell quite early, only to be followed by a much more severe relapse. In no case of relapse were bacilli found in the blood-stream, though no special attention was paid to this point. Recovery was more delayed in those cases in which bacilli were found after the fourteenth day than when they were found before this day associated with a positive Widal reaction. The early appearance of agglutinin is undoubtedly of good omen. Some cases suggest that the different reactive and immunizing substances produced by the infection are not always developed *pari passu*. For example, several cases showed an absence of blood infection at a stage of the dis-

case when the Widal reaction was negative or only partially positive. This seemed to Tebbutt to be explained in some cases by the occasional production of bactericidin in much larger amount than agglutinin.

Journal of Obstetrics and Gynecology of the British Empire, London

April

16 Pathology of Tumors of the Corpus Uteri. R. F. C. Leith.
17 *Method of Radical Extirpation of the Cancerous Uterus Based on a Series of Forty-Nine Cases. E. H. Tweedy.

17. **Radical Operation for Uterine Cancer.**—The point of greatest interest in these cases of uterine carcinoma centers around the question of operability and inoperability. It is apparent from the description given that Tweedy does not consider fixation of the uterus, pain, purulent discharge, infiltration of the broad ligaments, and cachexia, contra-indications to operation. In patients with serious involvement of the rectum and involvement of the bladder with pyuria, recovery from immediate operation is not likely to give relief to symptoms or prolong life. These alone are the cases Tweedy refused to operate. Extreme fatness is a hindrance but not an absolute contra-indication to the abdominal operation. Cachexia may point to involvement of the liver, but not necessarily, and even were the liver involved to a slight extent he does not see that it constitutes an insuperable barrier to the removal of a cancerous growth. Contrary to the popular belief cancer may be almost the least painful of mortal ailments. At necropsies, he has seen most extensive malignant disease undiagnosed during life and causing an absolutely painless death. When cancer ulcerates it causes pain, horrible fetor and destroys the appetite by absorption of toxins. The result is the most dreaded form of disease. To save such pain and distress is to Tweedy a justification for operation even if metastases are already present. Tweedy is a strong advocate for the use of buried fine silk ligatures and sutures prepared after Kocher's method. He says they are perfectly safe in early cases but have no place whatever in advanced cancer. Catgut should be used here even for the abdominal wall and in the latter situation he reenforces by silkworm gut mattress sutures through the skin and aponeurosis, tied on the skin over buttons at each side of the incision.

Archives Générales de Chirurgie, Paris

March, V, No. 3, pp. 241-360

18 *Rational Operative Treatment of Breast and Superficial Cancers. (La thérapeutique chirurgicale rationelle du cancer du sein et des cancers cutanés en général.) P. Nadal.
19 *Industrial Electric Burns. A. Besson.
20 Cystic Epitheliomas of the Breast. F. Jacoulet and P. Moure. Commenced in No. 2.

18. **Treatment of Cancer of the Breast.**—Nadal remarks in regard to the propagation of cancer that mechanical laws propose but the soil disposes, and that some of the mechanical laws involved have been overlooked hitherto. Among the points to which he thinks greater attention should be paid is the traumatism from the preparation of the field for the operation. The lymphatic circulation in the region is affected by these preliminaries and the diffusion of cancer cells promoted by the mechanical injury before the operation is even commenced. Cancer cells are not closely coherent to each other and by the manipulations before and during the operation are actually forced out into the efferent vessels. They are thus carried in suspension in the blood and lymph and when blood and lymph exude into the wound they bring cancer cells back with them, even when the actual cancer has been removed in a single mass into sound tissue. The retraction of the tissues after they are cut forces out the blood and lymph bearing the cancer cells, forcing them both outward into the wound and inward into the efferent veins and lymphatics. Before the patient reaches the surgeon he has felt of his cancer innumerable times, and the neoplasm should be covered with a protecting dressing and even the surgeon should refrain from all but the lightest palpation and the skin should be prepared for the operation without friction. Nadal advocates removing the cancerous focus alone, and only after this wound has healed, that is, not until fifteen to twenty-five days later does he cut out all the scar and adjacent tissue forming the bed of the tumor. In a cancer of the breast, for instance, he cuts out the nipple, the cancer focus and the intervening tissue in one mass in the first operation. At the second operation, he removes with the bed of the tumor all the cancer germs that have been poured out into the wound. An additional advantage of thus operating at two sittings is that if the supposed cancer proves to be non-malignant, there is no need for further mutilation of the patient. In case of recurrence, he emphasizes the fact that even advanced cancer is merely a multilocal affection and the surgeon should attack every accessible metastasis as if it were the only localization of the disease.

19. **Industrial Electric Burns.**—Besson reports two severe cases and gives the details of eight others from French literature. They confirm the assumption that in an electric accident there is first primary inhibition of the respiration; the arrest of the heart action is secondary. The burning of the tissues serves as an "interrupter" and allows the organism to gain time before succumbing to the effect of the current, so that artificial respiration in time will resuscitate the patient just as after apparent death from drowning or under chloroform. Instead of the Silvester technic, he compresses the chest with his hands applied flat on each side, then suddenly releasing the pressure. The tongue should be drawn out and occasionally the depths of the throat may be touched with a tampon wound on a forceps. He quotes in conclusion Jellinek's advice in regard to cold enemas, venesection, lumbar puncture, possibly brief reapplication of the same current, and keeping the head high, as supplementary measures. But artificial respiration is the main reliance.

Bulletin de l'Académie de Médecine, Paris

May 16, LXXV, No. 20, pp. 553-576

21 *Prophylaxis of Hereditary Transmission of Syphilis. (L'Hérédosyphilis.) C. Leroux and A. Pinard.
22 *Radium Ions in Therapeutics. (Introduction de l'ion radium dans les tissus pathologiques, sans effraction de l'enveloppe tégumentaire.) A. Béclère.

21. **Inherited Syphilis.**—Leroux has been studying conditions in 136 syphilitic families; there were 413 pregnancies, with only 207 children born alive. He has charge of a dispensary and he urges careful search for signs of inherited syphilis in every infant seen at a dispensary. From the infant it is easy to trace out the syphilis in the parents which would otherwise escape detection. It should be sought for as tuberculosis is now hunted out, and the parents should be educated in their duty to their offspring, especially the four things which they should avoid, as Fournier has proclaimed, namely, begetting children at all, failing to watch over the health of their offspring from birth, failing to institute treatment for the inherited syphilis, and failure to keep up this treatment in the same way and for as long a period as for acquired syphilis. Pinard corroborated Leroux' statement in regard to the necessity for keeping continuous moral and therapeutic control over the family, but he emphasized still more the preponderant part played by the father in the transmission of syphilis to the children. When derived from the mother, the inherited syphilis is more harmful and more tenacious, but in his experience the infection is derived from the father in the majority of the cases, and the mother may escape. He adds that no person having contracted syphilis, whatever the interval since or the courses of treatment, is ever absolutely certain of being cured, from the standpoint of offspring, and physicians should impress on their syphilitic male patients that to have healthy children they must take a special, additional systematic course of treatment, *la cure de l'hérédité*.

22. See Paris Letter in THE JOURNAL, June 10, page 1735.

Journal de Chirurgie, Paris

March, VI, No. 3, pp. 249-364

23 Technic and Indications for Decortication of the Lung, According to Delorme, for Chronic Empyema. R. Picqué.

April, No. 4, pp. 365-488

24 Treatment of Crushing Injuries of the Legs. (Les écrasements du membre inférieur.) L. Impert.

May, No. 5, pp. 489-616

25 *Rhizotomy for Tabetic Gastric Crises. (L'opération de Förster dans le traitement des crises gastriques du tabes.) R. Leriche and G. Cotte.

25. **Resection of Posterior Spinal Roots for Tabetic Gastric Crises.**—Leriche and Cotte report a case and summarize ten others from the literature, giving an illustrated description of the technic. Two of the eleven patients died from infectious complications, but in all the other cases the operation seems to have conquered the gastric crises. In six of the surviving nine patients the result was a complete success and the others were cured for a time at least. Study of the cases shows that the operation should be reserved for cases in which the gastric crises are due to a lesion in the sympathetic nerve, with little inflammation of roots and meninges. When the latter are involved there is liability of some recurrence of symptoms after a few months, as occurred in the case reported. One of the eleven operations cited was done in Holland, two in France and the others in Germany.

Lyon Médical, Lyons

April 9, CXVI, No. 15, pp. 633-676

26 Absorption of Sugar by Kidney Tubules. (Résorption du sucre par les tubes du rein.) R. Lépine.

April 16, No. 16, pp. 677-732

27 Interpretation of Radiologic Findings in Lungs, Bronchi and Adjacent Vessels. F. Barjon.

April 23, No. 17, pp. 733-776

28 Abdominal Hysterectomy for Uterine Myoma; 400 Cases. Albertin.

29 *Analogies Between Epidemic Pneumonia in Institutions and Pneumonic Plague. (Analogie entre la peste mandchourienne et les épidémies hospitallères de pneumonie. Traitement. Prophylaxie.) H. Rondet.

29. **Fixation Abscess in Pneumonic Plague.**—Rondet has been impressed with the analogies between the pneumonic plague as it is described in reports from the Orient and epidemics of pneumonia which he has observed in an institution at Lyons. Cold, dampness, lack of sunshine and overcrowding favored the spread of epidemic pneumonia, but it did not spread outside the institution. Rondet does not think there is danger of the spread of the plague in Europe. His experience with fixation abscesses in pneumonia has been so favorable that he urges a trial of Fochier's aseptic turpentine abscesses as liable to be useful in plague. It is stated that the disease generally runs a milder course when a bubo suppurates.

Presse Médicale, Paris

May 13, XIX, No. 38, pp. 385-400

30 *Distribution of Cancer in France. (Statistique du cancer d'après des documents nouveaux.) J. Bertillon.

31 *Traumatism and Tuberculosis. J. Ribera y Sans.

May 17, No. 39, pp. 401-408

32 *Subarachnoid Meningeal Hemorrhage. A. D'Espine.

33 *Fixation of Tube in Larynx. (Fixation des tubes d'O'Dwyer dans le larynx par le procédé de Polverini et Isonni.) A. Bonain.

May 20, No. 40, pp. 409-424

34 *Albumin Reaction in Pulmonary Tuberculosis. H. Roger and Lévy-Valensi.

35 Streptothricosis. (Quelques remarques sur les oosporoses.) L. Bory.

36 Mucilaginous Laxatives. A. Mathieu.

30. **Distribution of Cancer.**—Bertillon's article was summarized in the Paris Letter in THE JOURNAL, April 8, page 1050. The diagrams and maps show further that among forty-nine French cities with over 30,000 inhabitants, of the sixteen in which comparatively little meat is consumed per capita, only two of the cities are in regions where cancer is prevalent. His tables also show the relative rarity of cancer among Jews, in Algeria and at Amsterdam, and the increasing frequency of cancer of the stomach and rectum, according to the French statistics; the number of cases of malignant disease of other organs has kept about stationary year after year since 1876.

31. **Traumatism and Tuberculosis.**—Ribera has been paying special attention to the coincidence of trauma and development of tuberculosis in a joint in his 606 operative cases. In sixty-four of the 141 cases of tuberculous processes of the larger joints there had been some preceding local trauma. This coincidence is too frequent to be merely casual, and he reports experiments on over 135 rabbits or guinea-pigs to determine the connection between the trauma and the following tuberculous process. The results show that the synovial membrane protecting the joints is endowed with remarkable resisting powers, so that it proved impossible to induce a primary tuberculous synovitis in the animals by intravenous or direct injection of tubercle bacilli into the joint. On the other hand, the experiments demonstrated that the tubercle bacilli have a special predilection for the bone marrow. In the various inoculation experiments they seemed to pass constantly into the bone marrow; even when they did not induce any lesions, inoculation of guinea-pigs with the bone marrow gave positive results. In man, from some minute focus in a gland the bacilli may pass to the bone and be ensconced there, without giving rise to any pathologic process; then if a joint near by is injured in some accident the synovial membrane is no longer able to protect the joint against the invasion of the bacilli. In his experiments he was never able to induce a tuberculous joint process except when the joint had been previously injured by direct injection of staphylococci; then, when tubercle bacilli were injected into a vein or into a joint, they were liable to locate in the joint and set up a white swelling. Mixed infection is thus probably the explanation for the positive results obtained in experimental research by others which have been accepted as proving the possibility of pure primary tuberculous joint lesions.

32. **Subarachnoid Meningeal Hemorrhage.** — In D'Espine's case a boy of nearly 11 had an attack of apoplexy with unconsciousness, convulsions, left hemiplegia and other symptoms indicating considerable hemorrhage in the lower subarachnoid space. The next day 16 c.c. of turbid and hemorrhagic cerebrospinal fluid under strong pressure was evacuated by lumbar puncture and the child regained consciousness. Exacerbation of symptoms prompted a second and third puncture the sixth and fifteenth days, after which all the symptoms gradually subsided. Nine days before the stroke the boy had fallen on the back of his head while skating, but he had not seemed to suffer from the fall. Bollinger has related a similar case of tardy post-traumatic apoplexy in a girl of 13 who died in less than two hours after the onset of the apoplexy which occurred a few weeks after a fall while skating. Others have reported similar cases, but D'Espine's is the only one of which he knows in which the patient recovered, and he is certain that the three lumbar punctures contributed to the favorable outcome.

33. **To Fasten the Laryngeal Tube in Place.**—Bonain commends from practical experience the Polverini and Isonni method of holding the tube in place by a stout silk thread introduced through the thyrohyoid membrane with a curved needle passed out through the pharynx. The thread is tied to the tube and the upper end of the thread is brought out through the mouth while the lower end, where it projects from the neck, is fastened around a roll of gauze.

34. **Albumin in Tuberculous Sputum.**—Roger and Lévy-Valensi reiterate that the presence of albumin in the sputum is the best means to trace the course of pulmonary tuberculosis, to determine when the process has been arrested and finally to affirm the cure. A few drops of acetic acid are added to the diluted sputum; it is then filtered, a little salt added and the whole heated to coagulate out any albumin that may be present. They tabulate the findings in 1,374 tuberculous patients or suspects from their own practice and that of eighteen other clinicians. The findings were negative in twenty-five of the forty clinically cured patients and in five of their own series of 141—their negatives including three suspects, one patient with acute miliary tuberculosis and one cured patient. The findings were negative in only seventy-six of the total 1,374 cases.

Deutsche medizinische Wochenschrift, Berlin

May 18, XXXVII, No. 20, pp. 913-960

37 *Prophylaxis and Treatment of Scarlet Fever. J. Lange.

38 Reciprocal Relations Between Lung and Chest with Emphysema. (Wechselbeziehungen zwischen Lunge und Thorax bei Emphysem.) H. Loeschcke.

39 Tincture of Soap and Alcohol in Disinfection of the Hands. W. Schumburg.

40 Serodiagnosis of Syphilis. (Auswertung des Antigen-Extraktes.) H. Hecht.

41 Elimination of Diastatic Ferment in the Urine. A. Rosenthal.

42 Treatment of Hay Fever. (Heufiebertherapie.) R. Hoffmann.

43 Experimental Syphilis. (Syphilitische Allgemeinerkrankung beim Kaninchen durch intrakardiale Kulturimpfung.) J. Scherescheweky.

44 *Glycerin Treatment of Pernicious Anemia. Muktedir Effendi.

45 Water-Jet Massage. (Die Verwendung der Wasserdruckmassage in der Gynäkologie, Odontologie, Rhinologie, Otologie, Neurologie, internen Medizin, Dermatologie und Urologie.) W. H. Dreuw.
46 Tests for Milk. (Die Säurebestimmung und die Labbemmprobe der Milch.) K. Schern.

37. **Scarlet Fever.**—Lange declares that isolation is necessary for at least five weeks in case of scarlet fever, up to ten weeks or more. No child should return to school without a certificate from a physician that desquamation is over. It seems evident that scarlet fever is not contagious during the first twenty-four hours; this permits isolation in time. He insists that every case belongs in the hospital. In treatment, cautious tepid baths are of advantage but even more important is it to keep the mouth, nose and throat thoroughly cleaned without irritating the mucosa. Weak salt solution is perhaps the best rinsing water for the purpose, syringing out the mouth and nose. Even if this does not prevent the dreaded mixed infection, it is an advantage to have the child accustomed to such measures when mixed infection does develop. The scarlatinal diphtheria once installed, he injects 0.5 gm. of 3 per cent. phenol, twice a day, into the pillars of the fauces. He has often seen children with the severest general symptoms of sepsis with purulent discharge from mouth and nose and enormously swollen glands, with bad, rapid pulse, somnolency and cool feet and hands, recover completely under the influence of these systematic injections. The diet should be carefully regulated for weeks after a severe scarlet fever. He reviews the various complications, and remarks in conclusion that the old saying is still true that a mother can never be entirely happy in her child until it has successfully passed through scarlet fever.

44. **Glycerin in Pernicious Anemia.**—In Muktedir's case the patient was a man of 30 infected with syphilis four years before; the anemia continued to progress even under mercury and iodid until there were only 970,000 red and 4,000 whites, with 20 per cent. hemoglobin. Death seemed impending when a course of glycerin was commenced last February. A tablespoonful of glycerin was given three times a day at first, and later up to 70 gm. The man began to improve at once and by the end of a month the reds numbered 4,200,000, the whites 5,300, with 100 per cent. hemoglobin. This confirms Tallquist's experience in a similar case. Both patients seem to be permanently cured. Muktedir's patient is still taking a little glycerin and seems strong and well. It is possible, he adds, that the glycerin may benefit only in the cases of anemia of intestinal origin. The only by-effect in his case was a brief transient diarrhea.

Medizinische Klinik, Berlin

May 21, VII, No. 21, pp. 801-838

47 *Treatment of Tuberculosis of Joints. (Die moderne orthopädische Behandlung der Gelenktuberkulosen.) E. Klose.
48 The Electrocardiogram. H. Winterberg. Commenced in No. 20.
49 *Treatment of Gastric Ulcer. (Kritisches zur Behandlung des Magengeschwürs.) H. Strauss.
50 Determination of Temperature of Infants' Food. (Die Wärmemessung der trinkfertigen Säuglingsnahrung.) H. Roeder.
51 The Glycerin Tampon in Gynecology. F. Kermauner.
52 Radium Emanations in Therapeutics. A. Fürstenberg.
53 Case of Acute Hemorrhagic Encephalitis. M. Ulrich.
54 Colored Glass Wedges for Hemoglobinometer. (Verwendbarkeit von Goldrubingläskeilen zu kolorimetrischen Bestimmungen von Hämoglobin und Eisen im Blute.) Charnass.

47. **Joint Tuberculosis.**—Klose regards conservative treatment as indicated in every case of tuberculous hip joint disease, except where there is direct vital danger, as with neglected suppuration with high fever and anemia. Under all other conditions conservative treatment is to be preferred and no considerations, such as the length of the course of treatment or the poverty of the patient, should deter from it. The poor functional results speak strongly against resection. In over 21 per cent. of his cases, the conservative immobilization of the hip joint in a cast, permitting the patient to be up and about, restored an ideal function to the joint with normal gait. Alapy has reported a similar outcome in over 21 per cent. of his 122 cases. The same applies to tuberculous knee lesions. General measures to supplement the local are indispensable, and the walking casts are very valuable in this respect, the patient not being confined to bed or room. Klose also advocates systematic tuberculin treatment, as this has a marked curative action on the local process, besides the benefit on the general health. The combination of tuberculin treatment with orthopedic measures for joint tuberculosis is one of the greatest triumphs of modern medicine, he thinks.

49. **Gastric Ulcer.**—Strauss cites some recent statistics which show that only about 50 per cent. of patients with gastric ulcer are permanently cured by internal treatment. It was formerly assumed that fully 90 per cent. of the non-hemorrhagic ulcers heal. He does not approve of some of the later diagnostic measures advocated as he makes it a principle to avoid all mechanical or other irritation of the interior of the stomach. He urges the importance of a course of internal measures when there is the slightest suspicion of an ulcer, as it can scarcely ever do harm, while the lack of it may do irreparable damage in case of an actual ulcer. He advocates prolonging the course of dieting even after the patient has apparently recovered. After considerable hemorrhage, he permits no food by the mouth, believing that the blood thus poured out into the gastro-intestinal tract will serve to nourish the patient for a time; even were this not the case he would be deterred from feeding by the mouth through fear of detaching some thrombus and thus starting the hemorrhage again. Hunger is borne better than thirst, and by proctoclysis, the "drop enema," the patient can be supplied with fluids besides the nutrient enemas, which he likes to give also by the drop method. Radioscopy has shown that the empty stomach keeps contracted, which is an aid in the healing of an ulcer. Operative treatment is the only means of cure for callous ulcer, but it is not indicated with ordinary simple ulcer unless the latter is refractory to repeated and prolonged internal courses or there is recurring hemorrhage. In the last year he has had three cases in which symptoms of ulcer recurred after an apparently successful operation. This confirms the importance of internist care long continued after every operation on the stomach, to prevent recurrence. The question now is to determine the other factors inducing ulceration, besides the factor of excessive secretion.

Münchener medizinische Wochenschrift

May 16, LVIII, No. 20, pp. 1057-1112

55 *Self-Infection in Obstetrics. (Zur Frage der Selbstinfektion in der Geburtshilfe.) M. Hofmeier.
56 Volvulus of Sigmoid Flexure and Hirschsprung's Disease. A. Heller.
57 Importance of the Etiology in Estimating Mild Melancholia. (Bedeutung der Aetiologie bei der Beurteilung leichter Depressionszustände.) G. L. Dreyfus.
58 *Fatalities After Injection of Salvarsan in Cardiovascular Disease. (Ueber Todesfälle nach Salvarsaninjektionen bei Herz- und Gefässkrankheiten.) K. Martius.
59 Technic for Intravenous Injection of Salvarsan. H. Ploeger.
60 Source of Error in Serodiagnosis of Echinococcus Disease. A. Brauer.
61 Plastic Operation for Prolapse of Rectum. (Zur dauernden Beseitigung des Mastdarmvorfalles mittelst Beckenbodenplastik.) P. T. L. Hackenbruch.
62 *Functional Hypersecretion of Glands in Bladder Mucosa. (Funktionelle Hypersekretion der Blasenschleimhautdrüsen.) R. Oppenheimer.
63 Treatment of Uncomplicated Breech Presentation. J. Rothschild.
64 *Pessary Treatment of Prolapse of Rectum. A. Hofmann.

55. **Self-Infection in Obstetrics.**—Hofmeier has recently had two cases of acute sepsis after a normal and spontaneous delivery in previously healthy women of 17 and 28. These are the only cases of sepsis after normal delivery in his service during twenty years with over 11,500 obstetric cases. The necropsy in both revealed purulent plugs in the tonsils and the glands in the neck were enlarged in one case, but there had been no signs of tonsillitis at the time in either patient. He ascribes the sepsis to the arousing of virulent germs in the throat by the stress of the birth process, and their flocking to the wound left by separation of the placenta; they also evidently passed into the intestines and set up a local inflammatory process at various points. In the first case hemolytic streptococci could be cultivated from the lochia and the following day from the blood and yet the uterus wall was found normal throughout, the interior merely coated with a turbid secretion, the surface a reddish gray. In the other case the slight reaction in the cellular tissue of the uterus and the lack of inflammation in the veins and lymphatics seemed to exclude the possibility of infection from without; otherwise

the typical local reaction would have been much more serious. One tube contained pus and the fatal peritonitis had developed from this. He adds that it is evident that hysterectomy would have been useless in both cases, although everything at the time seemed to point to the uterus as the seat of the infection. If the cases had occurred outside of a well equipped and well managed maternity, the physician or the midwife might have been assumed to be responsible for the infection. Hofmeier ascribes it to self infection from some practically latent focus elsewhere.

58. **Fatalities After Injection of Salvarsan in Syphilitics with Cardiovascular Disease.**—This communication issues from Ehrlich's institute and in it are analyzed all the cases of this kind on record, with those that have occurred in the institute, and those of which Ehrlich has been informed personally by letter or telegraph. Eighteen cases are thus listed, including three from his own experience and seven from the literature. The other eight fatalities have never been published. Martius concludes from his analysis of the cases that in only seven can there be any question as to the connection between the fatality and an injurious action of the drug on the heart. He states that in five of this group of seven, necropsy revealed the triad: syphilitic aortitis, coronary sclerosis and myocarditis or myodegeneration of the heart. In the sixth case there was hypoplasia of the heart and aorta, and in the seventh, in which the patient died in collapse, such severe changes were found in other organs as to offer a plausible explanation for the fatality, aside from the medication. In four of the total seven no objective signs of trouble in the heart or vessels had been apparent on clinical examination, and in three of these four there had been nothing to call attention to the heart in any way. The experiences related demonstrate, he says, that the above triad of aortitis, coronary sclerosis and myocarditis should absolutely contra-indicate the use of the drug. No unfavorable influence on the sound heart from salvarsan need be anticipated, he says, even with intravenous administration, if the dose is small, not over 0.3 gm., and if it is copiously diluted and care is taken that the reaction of the solution is not acid. Other experiences which he relates show, he adds, that angina pectoris, without complications on the part of the heart, is influenced by the salvarsan in the most favorable manner.

62. **Nervous Hypersecretion of Bladder Mucosa.**—Oppenheimer has encountered five cases in which tenacious masses of mucus were seen in the bladder and the patients complained of a smarting during micturition and unusually frequent desire to urinate during the day—not at night. The cystoscopic findings were approximately normal but the patients were extremely nervous and easily fatigued, and distressed by their symptoms which suggested chronic cystitis. Treatment should aim to convince the patients that the trouble is merely a harmless functional hypersecretion of the mucous glands. No local treatment is required; the aim should be to divert the attention away from the bladder and tone up the nervous system in general.

64. **Pessary Treatment of Rectal Prolapse.**—Hofmann's patient was a woman 70 years old, with extensive prolapse both of rectum and vagina. He introduced a pessary into the rectum and another into the vagina, fastening them together with a wire through the septum between. The prolapse was cured and the patient has worn her pessaries for several months without disturbance.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 11, XXXII, No. 57, pp. 603-610

65 Oculomotor Paralysis from Peripheral Trauma. T. Di Giuseppe.

May 14, No. 58, pp. 611-626

66 *Cacodylic Poisoning from Medicolegal Standpoint. E. Di Mattei.

May 16, No. 59, pp. 627-634

67 *Pelvic Fixation of Uterus for Retroflexion. (Retrofiessione uterina e cura alla Pestalozza.) U. Ragusa.

May 18, No. 60, pp. 635-642

68 Fixation of Complement in Pellagra. (Ricerche sulla fissazione del complemento nel pellagroso.) L. Lucatello and M. Carletti.

66. **Cacodylic Acid from Medicolegal Standpoint.**—Cacodylic acid and salts are said to be free from toxicity, but Di Mattei's experiments with ten guinea-pigs, four rabbits and four dogs showed that sodium cacodylate is liable to induce symptoms and lesions showing great analogy with those from poisoning with mineral arsenic, both in the acute and chronic cacodylic poisoning. There was evidently an inflammatory process in both, differing only in its course, the parenchyma of the different viscera suffering the most. The liver and kidney parenchyma showed fat degeneration and necrotic lesions but the suprarenal capsules suffered most, the multiplicity and gravity of the lesions testifying to the fact that the suprarenals have less resisting power than the other organs to the injurious action of the drug. The conditions of the experiments were made to resemble those of the therapeutic administration of the cacodylic acid in the chronic cases, while the other animals were given from 0.15 to 3 gm. of sodium cacodylate at one time, which always proved fatal in less than twenty-four hours after the subcutaneous injection. The symptoms of the acute poisoning corresponded to those from poisoning with organic arsenic.

67. **Intrapelvic Fixation of the Uterus for Retroflexion.**—Ragusa reviews fifty-seven cases in which Pestalozza's technic has been applied to correct retroflexion, and with the best results, by half a dozen gynecologists in Italy and at Pestalozza's clinic. The main feature of the technic is fastening the uterus in its normal position by suturing to the fundus a flap of peritoneum slit from the reflection on the inferior segment of the uterus. The flap includes, besides the strip of peritoneum and the connective tissue connected with it, a few muscular fibers from the external musculature of the bladder. The uterus is thus held in normal position without interfering with its physiologic expansion. All the patients on record have been free from disturbances since, and a number have passed through normal pregnancies.

Policlinico, Rome

May 14, XVIII, No. 20, pp. 617-648

69 *Lumbar Puncture in Treatment of Trauma of the Head. (Terapia del traumatismi cranio-encefalici per mezzo della puntura lombare.) B. Prampolini.

70 Salvarsan in Syphilis. I. Ullmann. Commenced in No. 19.

71 Intravenous Mercurial Injections in Septicemia. S. de Rossi and others.

May 21, No. 21, pp. 649-680

72 Frambesia. (Frambœsia tropicale, buba brasiliana e malattia del Breda.) F. Rho.

73 *Influenzal Ear Lesions. T. Mancioli.

69. **Lumbar Puncture After Trauma of the Head.**—Prampolini reviews twenty-six cases on record in Italian literature in which lumbar puncture was applied in treatment of traumatic lesions of the head, and then reports a case from his own experience which illustrates anew its advantages. His patient was a man of 30 who had fallen on his back, hitting the right parietal temporal region of the skull. Periods of great agitation alternated with extreme drowsiness and the pupils did not react to light or in accommodation, while the mind did not seem quite clear. There was intense headache in the right parietal region and the spine was tender, but there were no signs indicating fracture of the skull. Lumbar puncture released about 20 c.c. of a turbid, cherry-red fluid, under high pressure, and benefit was soon apparent. A second and third puncture were made the following and the third day, and by the end of nine days after the accident the patient was entirely restored. The trouble had evidently been a contusion of the brain with hemorrhage inducing abnormally high pressure on the brain. The headache and symptoms of irritation subsided completely after the second puncture, and by the third the cerebrospinal fluid was clear and colorless, showing that the extravasated blood had been reabsorbed.

73. **Influenzal Ear Lesions.**—Acute catarrhal otitis media was remarkably frequent, Mancioli states, during the epidemic of influenza at Rome this year, but it generally subsided without suppuration. Primary mastoiditis without involvement of the middle ear was also frequent; he operated in thirty cases of the kind. In each the trouble was a diffuse osteomyelitis rather than an abscess, and in nearly all healing was by primary intention after complete evacuation, removing all the bone involved.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, Los Angeles, June 27-30.

American Academy of Medicine, Los Angeles, June 23-26.
American Ophthalmological Society, New London, Conn., July 11.
American Otological Society, Atlantic City, June 26-27.
American Proctologic Society, Los Angeles, June 26-27.
Arizona Medical Association, Los Angeles, June 26.
Conf. of Bds. of Health of N. America, Los Angeles, June 30-July 1.
Maine Medical Association, Augusta, June 28-29.
Oregon State Medical Association, Los Angeles, Cal., July 10.

AMERICAN GYNECOLOGICAL SOCIETY

Thirty-Sixth Annual Meeting held at Atlantic City, N. J., May 23-25, 1911

(*Continued from page 1747*)

The Frequency and Clinical Significance of Funnel Pelves

DR. J. WHITRIDGE WILLIAMS, Baltimore: In typical funnel pelves the distance between the tubera ischii is reduced to 8 centimeters or less, while the usual measurement remained unchanged. Such pelves were noted in 6.1 per cent. of 2,215 consecutive full-term labors, are of equal incidence in white and black women, and sometimes give rise to serious dystocia. The funnel pelvis is the most common abnormality in white women, in whom it constitutes 44 per cent. of all deformed pelves. In colored women on account of the incidence of the more usual types, it is relatively less important, and stands forth in order of frequency. The prognosis depends not so much on the actual narrowing of the pubic arch or on the distance between the tubera ischii, as on the relation between it and the posterior sagittal diameter. Moderate degrees of dystocia can frequently be overcome by placing the patient in an exaggerated lithotomy or an exaggerated Sims' position. In either event, the antero-posterior and posterior sagittal diameters undergo an average increase of 1.62 cm., which so increases the available space as to make spontaneous labor possible. Such an enlargement affords an explanation for the successful outcome of certain low-forceps operations which appear theoretically impossible from the measurements taken in the usual position. Pubiotomy is the operation of choice in cases of pronounced dystocia, as it not only affects the delivery of the child, but leads to a permanent increase in the size of the outlet, which may be further enlarged by the softening of the fibrous union under the influence of the hyperemia incident to pregnancy, and thus make possible the spontaneous termination of subsequent labors.

DISCUSSION

DR. EDWARD REYNOLDS, Boston: The inferior strait of the pelvis is of vastly more importance than the gynecologist has supposed, and is probably of more importance than the superior strait.

DR. EDWARD P. DAVIS, Philadelphia: In cases of dystocia from funnel-shaped pelvis, when the obstetrician is called in consultation because the family physician cannot secure expulsion of the child, or finds it difficult to extract it, the instrument slipping, and the head of the child being low down, it is the duty of the practitioner to perform craniotomy, as the patient cannot be treated safely in any other way.

Diagnosis and Treatment of Contracted Pelves

DR. J. M. MUNRO KERR, Glasgow, Scotland: The diagnosis of contracted pelvis is not difficult, and the greater the deformity the easier the diagnosis. A careful measurement of the pelvis both by the hand and by a pelvimeter should be made. An estimate of the size of the child's head should be attempted both by palpation and cephalometer. The relative size of the head and pelvis should be estimated, and that should be the basis of treatment. Whenever possible this examination should be made in the thirty-sixth week, and again at the beginning of labor, if the pelvic deformity is of medium degree. One of the most striking features in connection with the treatment of contracted pelvis is the prominence given by all recent writers to spontaneous delivery. Spontaneous delivery is quite frequent with a conjugata vera of 9.3 cm. I have twice seen a child born spontaneously even with a pelvis of 7.5 cm., but no such case has occurred in my clinic during the last two and a half years. In 130 cases of contracted pelvis treated by forceps, the fetal mortality was 50 per cent., with a conjugata vera of 7.5 cm., 33 per cent. with a conjugata vera of 8.1 cm., and 15 per cent. with a conjugata vera of 8.7 cm. I have performed craniotomy seventeen times in the last two and a half years. I have done a pubiotomy three times, and symphyseotomy once. All these patients did well, and all the children did well. I consider pubiotomy an excellent operation, but it has a very limited field. Cesarean section is dangerous in suspect cases. In these cases the maternal mortality is 17.3 per cent., and if frequent examinations have been made it runs up to 34 per cent. If Cesarean section is performed in the suspect cases, undoubtedly the best results have been obtained by removing the uterus. What will lower the mortality and morbidity, both maternal and fetal, more than anything else is a more thorough training of students and young graduates to appreciate the importance of an early diagnosis of pelvic deformity and the limitations of every operation which may be employed.

DISCUSSION

DR. J. WHITRIDGE WILLIAMS, Baltimore: In the 2,200 cases which I discussed in my paper on funnel-shaped pelves, there were 16 per cent. of spontaneous deliveries in all classes of inlet contractions in white women as compared with 81 per cent. in black women.

DR. A. LAPTHORN SMITH, Montreal: The tendency to hurry matters in these cases is a curse rather than a blessing, and it comes about very largely from conditions peculiar to this country. In America the doctor is told to hurry up or the woman will get somebody else, and it is this hurry-up spirit which makes it difficult to instill into the mind of the young doctor the important point that he must not hurry delivery until the time comes for it to be effected.

DR. RICHARD C. NORRIS, Philadelphia: My attitude toward inducing labor in properly selected cases not more than two or three weeks before the calculated term will add to the table of spontaneous deliveries of the essayist. It is in this class that induced labor should be considered. The question of transperitoneal and intraperitoneal Cesarean section has never appealed to me. I believe that craniotomy is yet a conservative operation, which must be used in certain instances. I have twice in the past year been called on to perforate the head of the living child.

DR. HENRY D. FRY, Washington, D. C.: In Washington we have a large colored population, and I have noticed in examining a large number of pelves that fully 50 per cent. of the women have justo minor pelves. It is rather unusual for me to find in colored women a rachitic flat pelvis. In the white woman the justo minor pelvis is rather unusual, and the simple flat and rachitic flat pelves are more common. As to spontaneous labor, in the cases I have seen it has occurred in 60 or 70 per cent. of them.

DR. JOHN O. POLAK, Brooklyn: My results from premature labor have been unsatisfactory. The fetal mortality has been considerable, and it has subjected my patients to the possibilities of infection. My associate and I have done Cesarean section in sixty-one cases without a death, and many of these patients were handled and brought in off of the ambulance after several attempts at delivery with forceps had been made. We have had no difficulty in delivering these women, and they have had no marked morbidity, and no mortality.

DR. ROBERT L. DICKINSON, Brooklyn: There is a large field for the induction of labor. I do not allow primiparæ to run overtime unless they have been well starved. Starvation and early delivery have given me successful results so far as the fetal death-rate is concerned.

DR. EDWARD P. DAVIS, Philadelphia: With reference to Cesarean section, when a woman has had the test of labor and has a contracted pelvis, one need not necessarily wait for labor, but should resort to Cesarean section and in clean cases one will get good results.

the typical local reaction would have been much more serious. One tube contained pus and the fatal peritonitis had developed from this. He adds that it is evident that hysterectomy would have been useless in both cases, although everything at the time seemed to point to the uterus as the seat of the infection. If the cases had occurred outside of a well equipped and well managed maternity, the physician or the midwife might have been assumed to be responsible for the infection. Hofmeier ascribes it to self infection from some practically latent focus elsewhere.

58. **Fatalities After Injection of Salvarsan in Syphilitics with Cardiovascular Disease.**—This communication issues from Ehrlich's institute and in it are analyzed all the cases of this kind on record, with those that have occurred in the institute, and those of which Ehrlich has been informed personally by letter or telegraph. Eighteen cases are thus listed, including three from his own experience and seven from the literature. The other eight fatalities have never been published. Martius concludes from his analysis of the cases that in only seven can there be any question as to the connection between the fatality and an injurious action of the drug on the heart. He states that in five of this group of seven, necropsy revealed the triad: syphilitic aortitis, coronary sclerosis and myocarditis or myodegeneration of the heart. In the sixth case there was hypoplasia of the heart and aorta, and in the seventh, in which the patient died in collapse, such severe changes were found in other organs as to offer a plausible explanation for the fatality, aside from the medication. In four of the total seven no objective signs of trouble in the heart or vessels had been apparent on clinical examination, and in three of these four there had been nothing to call attention to the heart in any way. The experiences related demonstrate, he says, that the above triad of aortitis, coronary sclerosis and myocarditis should absolutely contra-indicate the use of the drug. No unfavorable influence on the sound heart from salvarsan need be anticipated, he says, even with intravenous administration, if the dose is small, not over 0.3 gm., and if it is copiously diluted and care is taken that the reaction of the solution is not acid. Other experiences which he relates show, he adds, that angina pectoris, without complications on the part of the heart, is influenced by the salvarsan in the most favorable manner.

62. **Nervous Hypersecretion of Bladder Mucosa.**—Oppenheimer has encountered five cases in which tenacious masses of mucus were seen in the bladder and the patients complained of a smarting during micturition and unusually frequent desire to urinate during the day—not at night. The cystoscopic findings were approximately normal but the patients were extremely nervous and easily fatigued, and distressed by their symptoms which suggested chronic cystitis. Treatment should aim to convince the patients that the trouble is merely a harmless functional hypersecretion of the mucous glands. No local treatment is required; the aim should be to divert the attention away from the bladder and tone up the nervous system in general.

64. **Pessary Treatment of Rectal Prolapse.**—Hofmann's patient was a woman 70 years old, with extensive prolapse both of rectum and vagina. He introduced a pessary into the rectum and another into the vagina, fastening them together with a wire through the septum between. The prolapse was cured and the patient has worn her pessaries for several months without disturbance.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 11, XXXII, No. 57, pp. 603-610

65 Oculomotor Paralysis from Peripheral Trauma. T. Di Giuseppe.

May 14, No. 58, pp. 611-626

66 *Cacodylic Poisoning from Medicolegal Standpoint. E. Di Mattei.

May 16, No. 59, pp. 627-634

67 *Pelvic Fixation of Uterus for Retroflexion. (Retroflessione uterina e cura alla Pestalozza.) U. Ragusa.

May 18, No. 60, pp. 635-642

68 Fixation of Complement in Pellagra. (Ricerche sulla fissazione del complemento nel pellagroso.) L. Lucatello and M. Carletti.

66. **Cacodylic Acid from Medicolegal Standpoint.**—Cacodylic acid and salts are said to be free from toxicity, but Di Mattei's experiments with ten guinea-pigs, four rabbits and four dogs showed that sodium cacodylate is liable to induce symptoms and lesions showing great analogy with those from poisoning with mineral arsenic, both in the acute and chronic cacodylic poisoning. There was evidently an inflammatory process in both, differing only in its course, the parenchyma of the different viscera suffering the most. The liver and kidney parenchyma showed fat degeneration and necrotic lesions but the suprarenal capsules suffered most, the multiplicity and gravity of the lesions testifying to the fact that the suprarenals have less resisting power than the other organs to the injurious action of the drug. The conditions of the experiments were made to resemble those of the therapeutic administration of the cacodylic acid in the chronic cases, while the other animals were given from 0.15 to 3 gm. of sodium cacodylate at one time, which always proved fatal in less than twenty-four hours after the subcutaneous injection. The symptoms of the acute poisoning corresponded to those from poisoning with organic arsenic.

67. **Intrapelvic Fixation of the Uterus for Retroflexion.**—Ragusa reviews fifty-seven cases in which Pestalozza's technic has been applied to correct retroflexion, and with the best results, by half a dozen gynecologists in Italy and at Pestalozza's clinic. The main feature of the technic is fastening the uterus in its normal position by suturing to the fundus a flap of peritoneum slit from the reflection on the inferior segment of the uterus. The flap includes, besides the strip of peritoneum and the connective tissue connected with it, a few muscular fibers from the external musculature of the bladder. The uterus is thus held in normal position without interfering with its physiologic expansion. All the patients on record have been free from disturbances since, and a number have passed through normal pregnancies.

Policlinico, Rome

May 14, XVIII, No. 20, pp. 617-648

69 *Lumbar Puncture in Treatment of Trauma of the Head. (Terapia dei traumatismi cranio-encefalici per mezzo della puntura lombare.) B. Prampolini.

70 Salvarsan in Syphilis. I. Ullmann. Commenced in No. 19.

71 Intravenous Mercurial Injections in Septicemia. S. de Rossi and others.

May 21, No. 21, pp. 649-680

72 Frambesia. (Frambœsia tropicale, buba brasiliana e malattia del Breda.) F. Rho.

73 *Influenzal Ear Lesions. T. Mancioli.

69. **Lumbar Puncture After Trauma of the Head.**—Prampolini reviews twenty-six cases on record in Italian literature in which lumbar puncture was applied in treatment of traumatic lesions of the head, and then reports a case from his own experience which illustrates anew its advantages. His patient was a man of 30 who had fallen on his back, hitting the right parietal-temporal region of the skull. Periods of great agitation alternated with extreme drowsiness and the pupils did not react to light or in accommodation, while the mind did not seem quite clear. There was intense headache in the right parietal region and the spine was tender, but there were no signs indicating fracture of the skull. Lumbar puncture released about 20 c.c. of a turbid, cherry-red fluid, under high pressure, and benefit was soon apparent. A second and third puncture were made the following and the third day, and by the end of nine days after the accident the patient was entirely restored. The trouble had evidently been a contusion of the brain with hemorrhage inducing abnormally high pressure on the brain. The headache and symptoms of irritation subsided completely after the second puncture, and by the third the cerebrospinal fluid was clear and colorless, showing that the extravasated blood had been reabsorbed.

73. **Influenzal Ear Lesions.**—Acute catarrhal otitis media was remarkably frequent, Mancioli states, during the epidemic of influenza at Rome this year, but it generally subsided without suppuration. Primary mastoiditis without involvement of the middle ear was also frequent; he operated in thirty cases of the kind. In each the trouble was a diffuse osteomyelitis rather than an abscess, and in nearly all healing was by primary intention after complete evacuation, removing all the bone involved.

mon but often refuted error that the rectal tube can be inserted into the colon. "Firm pressure" to check the secretion of milk is not necessary and of doubtful efficiency.

In the section on methods of destroying organisms and neutralizing toxic products in the blood and tissues of the body, the author is favorable to the collargol treatment and advises its general use. He seems to be ignorant of the investigation of the Council on Pharmacy of the American Medical Association. Phagocytin is unnecessarily given some space, since at the end of the paragraph the author says that further experiments failed to show that it exerted any favorable therapeutic influence.

The present state of the therapeutic use of the abscess of fixation is given without any recommendation by the author concerning its value. The intravenous injection of dilutions of formaldehyd solution is mentioned as having been tried in America with apparent success. A little further investigation of American literature would have shown that this dangerous experiment had a very ephemeral success. Serotherapy is judiciously discussed and the conclusion reached that its value is very questionable. Immunization by vaccines is likewise described and a more favorable view of its value obtained.

The indications for and the method of operative treatment of localized pelvic infection and of peritonitis are given with sufficient fulness. Hysterectomy is found indicated in cases of injury with infection and in some localized infections with abscess, in infected myoma and rarely in retention of fetus or placenta. Ligation of the pelvic veins is rarely indicated.

The book closes with a summary of treatment of both localized and general infection. It is a concise statement of the views of the author and worthily closes a laudable undertaking.

THE DAWN OF THE HEALTH AGE. By Benjamin Moore, D.Sc., M.R.C.S., L.R.C.P. Cloth. Price, $1.40 net. Pp. 204. London: J. & A. Churchill (Philadelphia: P. Blakiston's Son & Co.), 1911.

This book is another evidence of the growing popular interest in health topics. While written by an Englishman, it applies to conditions in the United States as well as in Great Britain. The author endeavors to demonstrate the necessity for an entire remodeling of the present system of medical service in the interest of the whole community, by showing that thousands of lives and millions of money can be saved every year if disease is attacked on scientific principles "instead of being dallied with as at present." Dr. Moore advocates a system of state medicine by which competent physicians are made officers of the state for the suppression of disease, as police officers are employed for the suppression of crime. The author has evidently a strong tendency toward state socialism. Great Britain is apparently farther advanced along this line than the United States, as is shown by existing British laws regarding invalidity insurance, employers' liability, care of the sick by the state, workingmen's insurance, etc. While one may not agree with all of the conclusions, the book is interesting and suggestive. Chapters on the follies of present public health service, the doctor and his patient in private practice and in state practice, the evils and abuse of hospital systems and the evolution of a national medical service contain the basic facts and theories from which the proposed system of the writer is developed. Evidently the advocates of public health reform in England have encountered the same opposition as that met in this country, as is shown by the comments of the author on the objection that such a plan would be an invasion of personal liberty. He says, "Let us next look at the matter from the point of view, so often called in evidence by opponents, of the sanctity of the home and the intrusion on it of an army of officials. This is an ancient bogey which was taken out of its cupboard, carefully dusted and filled with fresh straw to alarm the British workman and voter when free education was granted him for his children. He was then told that his hereditary castle was gone forever and that he would have no peace or quiet with his wife and family on account of the unwelcome and prying visits of the school attendance officer haling poor little Johnnie away to school as to some prison or torture chamber. Now is it so in fact, after a good many years of reign of the school board? Is this reign really a reign of terror? Is the school attendance officer an irksome person in constant attendance at the poor man's home? No; he is only a terror to those, and they are but a small percentage, to whom he ought to be a terror and to whom we would all wish him to be a terror, who would neglect their children in a wicked and criminal way. . . . These officers, although they visit homes, have no more terrors for honest people than either the policeman or the gas-meter inspector." In another chapter he says, "Under the new regime, medical treatment will be as free to everyone as is the school and education to-day and everyone must accept medical treatment in his own interest and that of the community just as he must to-day accept education for his child whether he wants it or not." Dr. Moore has presented an interesting argument for advanced constructive health legislation.

PUBLIC HYGIENE. By Thomas S. Blair, M.D., Neurologist Harrisburgh, Pennsylvania, Hospital. Assisted by Numerous Contributors. In Two Volumes. Volumes I and II. Cloth. Price, $10 net. Pp. 644, with 158 illustrations. Boston: Richard G. Badger, (1911).

The growing interest in public hygiene would seem to warrant the preparation and publication of a comprehensive work on this subject, adapted to the needs of the general practitioner and the lay worker in sanitation reforms. Such a book is greatly needed and on first inspection Dr. Blair's book seems to meet the indications. More careful examination, however, arouses the suspicion that the material for this work was hastily put together and that too little time has been given to the processes of digestion and condensation. Frankly, the impression left on the mind of the critical reader is that material for a single, compact volume has been padded out to form two and that much material has been given place in full, which could better have been summarized or abstracted and that undue haste has been used in getting the work out. The two volumes are copiously illustrated, the plates being well executed from a mechanical standpoint, but not always having a discernible connection with the text. For instance, it is difficult to see the value in a work on public hygiene of a photograph of the elevator entrance to the rest-room of the Waldorf Astoria Hotel. Large photographs of the exteriors of public and private institutions are also of no discernible value. The binding is lacking in stability.

A BRIEF TEXT OF PHYSIOLOGY. For Dental, Pre-Medical, and College Students. By Carl J. Wiggers, M.D., Department of Physiology, University of Michigan. Cloth. Price, $1.50. Pp. 207, with 47 illustrations. Ann Arbor: George Wahr.

This manual was originally intended for the use of dental students at the University of Michigan. It is an effort to cover the essentials of human physiology within the limits of the physiologic course given in dental schools. Only subjects of the greatest general interest have been included and discussions on debatable questions have been largely supplanted by statements of that side which to the author seemed to have the preponderance of evidence. It is rather more elaborate than a quiz-compend and is really a digest of present physiologic knowledge. A supplement contains directions for a number of experiments of use in demonstrating physiologic principles, space being left between the directions for each experiment, for the student to use in writing up laboratory notes.

THE INTERNATIONAL MEDICAL ANNUAL. A Year-Book of Treatment and Practitioner's Index. 1911. Twenty-Ninth Year. Cloth. Price, $3.50. Pp. 748. New York: E. B. Treat & Co.

This year-book, in its twenty-ninth year, is fully up to the standard of former editions. In it is given a comprehensive review of the year's work in treatment, covering practically the whole field of medicine and surgery in all their branches. A new feature is an index of the matter contained in the section on "Therapeutics" under the names of diseases in the section "Dictionary of New Treatment." This prevents the reader from missing new remedies (largely proprietaries, by the way) or a particular form of treatment which has not found its way into general use. The book is well illustrated, having a number of good colored plates.

seven; par-ovarian cyst in two; ovarian fibroids of the opposite side in one, and uterine fibroids in seven. Malignancy was found present in the walls of the dermoid itself in twenty-four cases, a number sufficient to warrant a more careful investigation of these growths in the future. Moreover, suppuration is exceedingly liable to occur in these cysts, and fatal termination from infection has been reported in not a few cases.

DISCUSSION

DR. GEORGE GELLHORN, St. Louis: I know of an interesting case which occurred in the practice of Dr. Ehrenfest, which I would like to relate briefly. A young married woman, during her first pregnancy, had to be examined, and the presence of a tumor was determined. Laparotomy was performed during the fourth month of pregnancy, and a cyst removed, which was found to be a dermoid. On the other side there was a smaller cyst of exactly the same nature. But, as experience has taught that the removal of both ovaries during pregnancy threatened to terminate pregnancy, the second smaller ovarian dermoid was left behind. The family desired more children, and so the second ovary was not removed. The first pregnancy terminated normally, but the woman is kept under constant control. This woman has borne a second child since, and is now being watched closely to see if she may possibly have a third child, after which the dermoid cyst will be removed to prevent the possibility of carcinomatous degeneration.

DR. T. J. WATKINS, Chicago: With a double dermoid it would seem very feasible simply to leave a part of the tumor which retains the corpus luteum, and this probably will prevent the interruption of pregnancy.

DR. BROOKS H. WELLS, New York: The removal of these ovaries during pregnancy does not interrupt pregnancy. I recall a case in which there were two dermoid cysts of both ovaries, which were removed, the patient being advanced four months in pregnancy and went on to term.

DR. W. P. MANTON, Detroit: I have never had a case in which I have operated on both sides during pregnancy, removing the dermoids. In all reported cases in which the dermoid is on one or both sides, pregnancy has gone on uninterrupted. The majority of operators advocate leaving behind a portion of an ovary.

The Blood-Supply of Uterine Myomata

DR. JOHN A. SAMPSON, Albany, N. Y.: The main intrinsic uterine arteries, to which the name arcling may be given, penetrate the anterior and posterior uterine walls and lie between the outer and middle third. Their course is horizontal in the lower portion of the body of the uterus and obliquely horizontal (upward), as one approaches the fundus. Each arcling artery terminates in a medial, radial or centripetal and peripheral branch, the latter often anastomosing with a similar branch of the opposite arcling artery, thus establishing a communication between the two main arteries. All along the course of each arcling artery, radial branches arise which terminate in the endometrium, and also peripheral branches arise which nourish the myometrium. Sections of injected uteri containing myomata show that all tumors of an appreciable size have an arterial blood-supply which varies greatly in different specimens and in the larger tumors is frequently greater than that of the myometrium. The same sections fail to demonstrate any veins in many of the tumors; in others a few small veins may be seen throughout the tumor or about its periphery, while occasionally they are quite evident, but never as abundant as in the myometrium. The extrinsic and intrinsic arterial supply of these tumors explains many of the clinical phenomena. I can readily understand why these tumors may be shelled out from the uterine wall with slight bleeding occurring only in a few places. Tumors in which veins are found in their substance and about the periphery suggest that the change between arterial and venous blood occurs within the tumor; in those in which veins are not found it is impossible to demonstrate where this takes place. The regressive changes in these tumors, calcareous deposits, and necroses, are in many instances due to alterations in the vascularity of the tumor as a whole or a portion of it.

(To be continued)

Book Notices

PUERPERAL INFECTION. By Arnold W. W. Lea, M.D., Lecturer in Obstetrics and Gynecology, the University, Manchester. Cloth. Price, $9. Pp. 384, with illustrations. New York: Oxford University Press, 1910.

The author has undertaken to describe the etiology, bacteriology and pathology of puerperal infection with as great scientific accuracy as possible and at the same time to keep in mind the practical and clinical aspects of the various types of infection, giving with clearness and fulness the modern methods of diagnosis and treatment. In this attempt he has succeeded in giving a clear picture of this complex subject and has inspired confidence in his practical direction for treatment by his conservative views. After a short historical review and a short chapter on definitions, follows a brief discussion on frequency, mortality and morbidity in England, Germany and the United States. Unnecessary operative interference is rightfully blamed for the continuance of a high morbidity and mortality.

The difficult subject of etiology is concisely but well handled. The bacteriology of the female generative tract, during both normal pregnancy and the puerperium and in infection, is followed by a discussion of the conditions predisposing to infection and the important question of heterogenous versus autogenous infection. The influence of examinations and operative procedures in increasing the danger from the vaginal organisms is spoken of, while the slight pyrexias in the early days of the puerperium following well-conducted labor is attributed to autogenetic infection. The chapters on general pathology and pathologic anatomy are brief but clearly written and profusely illustrated. The uncertain state of our knowledge concerning toxemia and septicemia and the importance to be attributed to the hemolytic function of streptococci is shown by the author in his treatment of this unsatisfactory subject in the chapter on symptomatology. He gives correctly what is known, but the impossibility of distinguishing clearly between toxemia and septicemia is shown. The localized infections are satisfactorily pictured.

In the important chapter on prophylaxis the subject of the disinfection of the vagina is thoroughly discussed and while the author agrees with the majority of teachers in omitting the vaginal douche in normal cases he advises it in prolonged labor, in cases of purulent vaginitis, in cases of intrapartum fever and in all operative deliveries. Good rules for hand disinfection are given. Unfortunately, he seems to discourage the general use of gloves by emphasizing the drawbacks attending their use. He gives observations of Ahlfield and Walthard concerning the favorable influences on the puerperium of a long third stage of labor, but unwisely admits that it is quite impossible to wait one hour in private practice for the delivery of the placenta. The advice to remove portions of retained placenta is not carefully enough limited to avoid risk from the dangerous manipulation. The recommendation of a 2 per cent. solution of liquor cresolis compositus for an intra-uterine douche is dangerous advice.

Nearly one-third of the book is properly devoted to treatment. The general principles of isolation, rest, drainage and non-interference, except when absolutely necessary, are inculcated. In carrying out the latter in local infection the author does not take a decided stand, but, after stating the position of Kronig, Winter and others who abstain from all local treatment, he describes the various means of using antiseptics by douche and other topical treatment, likewise the technic of tamponade, finger curettage, *écouvillonage*, which is favored by the author, and curettage is fully described. The conclusions reached concerning the latter procedure are in general fairly conservative. Hot vaginal douches and hot air are preferred to cold applications in localized pelvic inflammation.

Some criticism might be made of certain details of the measures of general treatment which are not free from exploded ideas that have been handed down from uncritical times. We cannot agree that beef teas and meat extracts are of great value. Enemas of milk, eggs and beef tea cannot be given every four hours for any considerable period of time. The term "high enema" is bad if it implies the com-

Salpingostomy in Pregnancy

DR. GEORGE GELLHORN, St. Louis: The occluded tubes are extirpated by the majority of operators. In a minority of instances, however, where the patient desires offspring, salpingostomy may be performed with safety. I operated in a case removing the left adnexa and splitting open the right tube. The patient gave birth to a healthy child three and a half years later and is about to be confined for the second time.

To prevent the recurrence of occlusion after salpingostomy, appropriate after-treatment is necessary, mainly the use of high degrees of dry heat. If the plastic operation is thus restricted, the patient will suffer no ill effects, even though a certain percentage of the tubes may again become sealed.

DISCUSSION

DR. THOMAS J. WATKINS, Chicago: I have recently been interested in the technic of salpingostomy, having had trouble in making an artificial opening in the tube to avoid constricting it. Even in cases where the incision is made parallel, where the mucous membrane is turned over into the serosa and stitched, after the operation is completed, the opening is surprisingly and disappointingly small. Of late I have modified the technic, making a longitudinal incision, beginning at the distal end of the tube and suturing the mucous membrane on either side of the ovary, and in that way offering hope of not constricting the tube and of its not becoming occluded. I recall one case of opening the tube where pregnancy took place. This was a case of infection due to induced miscarriage. Gonorrhea was excluded. Examination of the husband proved there were spermatozoa. These tubes were both opened through an anterior vaginal incision. The woman bore a child afterward, and had a tubal pregnancy later, and at the time of the tubal pregnancy the opposite tube was found normal, except that there were a few adhesions about the fimbriated end.

DR. FRANKLIN H. MARTIN, Chicago: For three or four years, instead of doing salpingostomy in these slightly sacculated cases, I have been in the habit of employing a method of opening the tubes and rendering them patulous by means of hydrostatic pressure. Any tube that will hold from ten minims to half an ounce of fluid should be treated in this way. The tube is brought to the surface, and, after being liberated from adhesions, is placed on a thick laparotomy gauze sponge, and then the tube is milked in the direction of the fimbriated end. Almost every one of these tubes will rupture at the fimbriated end, opening up the tube along the fimbria, and at the same time causing evacuation of the tube.

DR. J. WESLEY BOVÉE, Washington, D. C.: I have done several salpingostomies. I have had one case of pregnancy, and this was ectopic.

DR. ROBERT L. DICKINSON, Brooklyn: I have spread the tube on the ovary in sixteen or eighteen cases and dropped it.

Salpingitis

DR. FRANK T. ANDREWS, Chicago: Salpingitis is not a disease by itself. It is a part of a general pelvic inflammation. The field of action is not the pelvis alone. Pelvic inflammation, in the majority of cases, begins as an acute vulvar or vaginal or uterine infection with a tendency to spread through the tubes to the pelvic peritoneum. The infecting agent may be the gonococcus, streptococcus, members of the colon bacillus group, pneumococcus and staphylococcus. Each variety has many grades of virulence and varies in the intensity of its virulence. Patients differ in their power to resist or combat infection, and this resistance is not a fixed state, but changes constantly during the progress of the disease. If, with reasonable certainty, within a reasonable time, we can cure by vaccines, then operation is criminal. It is understood that vaccines are contra-indicated in the acute stages of this or any other pyogenic process. The toxins are already in excess in the tissues, and to add more would be folly. Furthermore, no efficient antitoxin has as yet been produced for the toxins of the pyogenic organisms. This leaves, then, the chronic form to be considered, and it is known that chronic gonorrhea and other pyogenic infections are often cured by vaccines. Then why may we not use autogenous vaccines in cases of salpingitis? One limitation to their use is to be found in the anatomic relations of the Fallopian tube to the pelvic peritoneum. Each injection is followed by a decided reaction. Such reaction is marked by an increase in the intensity of inflammation in every infected part, meaning much local peritonitis with its usual results, and perhaps a diffuse peritonitis with death. Another danger in cases such as these in which spontaneous auto-inoculations are taking place is that the spontaneous inoculation or rupture of the tube may occur soon after an inoculation with autogenous vaccine. The effect of this will be the same as of a greatly increased dose of the toxin in a patient with acute exacerbation of the pelvic trouble. That is, the effect of the vaccine will be greatly to increase the severity of the acute attack. I believe that treatment by immunization has almost infinite possibilities for the future, but that the present state of our knowledge does not warrant us in experimenting on our patients. The battle will be won only when we can produce immunity with impunity.

DISCUSSION

DR. SETH C. GORDON, Portland, Me.: Pyosalpinx was very much more common years ago than it is now. I operated on most of these cases through the vagina, making a thorough incision and establishing drainage, and nearly all those patients got well.

DR. EDWARD REYNOLDS, Boston: In many cases of chronic vaginal discharge, as soon as the tubes are dealt with, the vaginal discharge decreases. I am inclined to believe it is due to the probability that in chronic salpingitis there is a passage downward of small quantities of discharge or of a ferment, which, on emerging into the uterus or vagina, keeps up a much more profuse discharge in the larger passages, the tubes acting as reservoirs for the ferment, and that increasing the vaginitis, and after its removal the tubes are clear. It is difficult for me to see how we can expect any very large percentage of cures in these chronic cases of salpingitis by vaccination, when one remembers the physical state in which most of these tubes are left.

DR. T. J. WATKINS, Chicago: Dr. Andrews' paper is along the line of developing immunity, and he has said that a patient does not get well because the local disease gets better, but the local disease gets better because the patient develops a general immunity. And this has been the idea in the treatment of pelvic infections. Now, the gynecologist does everything he can to develop immunity. He has found that if he drains a pus tube or takes it out in the most surgical manner without spilling the pus, the patient's temperature is not shortened. The patient runs a fever for two or three weeks, probably a little longer with an operation than without it, because the amount of bacteria and poison removed by the operation is less than the amount of physiologic resistance cut down as the result of the operation. So in these cases the surgeon has very much to be thankful for in this contest between physiologic resistance and bacterial invasion.

Double Ovarian Dermoids in Pregnancy

DR. WALTER P. MANTON, Detroit: In the total number of cases collected there were twenty-seven double tumors noted in the non-gravid, and seventy-three single, and nineteen double, associated with pregnancy. In the non-gravid, twenty-three tumors were situated on the right side, and sixteen on the left. In the pregnant, of the single growths, eleven were on the right and ten on the left side. From the fact that, even with double tumors, menstruation is unaffected, or shows only slight disturbances late in the disorder, it appears that these growths have little influence on that function, and from the number of reported pregnancies do not, as a rule, prevent conception. On the other hand, their existence is always a menace to the health and even life of the mother during pregnancy, and especially following delivery, from the peculiar liability of dermoids to twisting of the pedicle, and in occasional instances during gestation, to the pressure caused by the size and position of the associated cyst. The coincidence of other new growths of the pelvic organs and dermoid cysts adds still greater danger to the maternal host, the two morbid products not infrequently becoming formidable complications in pregnancy, labor, or the puerperium. In thirty-one selected cases, there are noted as associated conditions: ovarian cyst in

the typical local reaction would have been much more serious. One tube contained pus and the fatal peritonitis had developed from this. He adds that it is evident that hysterectomy would have been useless in both cases, although everything at the time seemed to point to the uterus as the seat of the infection. If the cases had occurred outside of a well equipped and well managed maternity, the physician or the midwife might have been assumed to be responsible for the infection. Hofmeier ascribes it to self infection from some practically latent focus elsewhere.

58. **Fatalities After Injection of Salvarsan in Syphilitics with Cardiovascular Disease.**—This communication issues from Ehrlich's institute and in it are analyzed all the cases of this kind on record, with those that have occurred in the institute, and those of which Ehrlich has been informed personally by letter or telegraph. Eighteen cases are thus listed, including three from his own experience and seven from the literature. The other eight fatalities have never been published. Martius concludes from his analysis of the cases that in only seven can there be any question as to the connection between the fatality and an injurious action of the drug on the heart. He states that in five of this group of seven, necropsy revealed the triad: syphilitic aortitis, coronary sclerosis and myocarditis or myodegeneration of the heart. In the sixth case there was hypoplasia of the heart and aorta, and in the seventh, in which the patient died in collapse, such severe changes were found in other organs as to offer a plausible explanation for the fatality, aside from the medication. In four of the total seven no objective signs of trouble in the heart or vessels had been apparent on clinical examination, and in three of these four there had been nothing to call attention to the heart in any way. The experiences related demonstrate, he says, that the above triad of aortitis, coronary sclerosis and myocarditis should absolutely contra-indicate the use of the drug. No unfavorable influence on the sound heart from salvarsan need be anticipated, he says, even with intravenous administration, if the dose is small, not over 0.3 gm., and if it is copiously diluted and care is taken that the reaction of the solution is not acid. Other experiences which he relates show, he adds, that angina pectoris, without complications on the part of the heart, is influenced by the salvarsan in the most favorable manner.

62. **Nervous Hypersecretion of Bladder Mucosa.**—Oppenheimer has encountered five cases in which tenacious masses of mucus were seen in the bladder and the patients complained of a smarting during micturition and unusually frequent desire to urinate during the day—not at night. The cystoscopic findings were approximately normal but the patients were extremely nervous and easily fatigued, and distressed by their symptoms which suggested chronic cystitis. Treatment should aim to convince the patients that the trouble is merely a harmless functional hypersecretion of the mucous glands. No local treatment is required; the aim should be to divert the attention away from the bladder and tone up the nervous system in general.

64. **Pessary Treatment of Rectal Prolapse.**—Hofmann's patient was a woman 70 years old, with extensive prolapse both of rectum and vagina. He introduced a pessary into the rectum and another into the vagina, fastening them together with a wire through the septum between. The prolapse was cured and the patient has worn her pessaries for several months without disturbance.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 11, XXXII, No. 57, pp. 603-610

65 Oculomotor Paralysis from Peripheral Trauma. T. Di Giuseppe.

May 14, No. 58, pp. 611-626

66 *Cacodylic Poisoning from Medicolegal Standpoint. E. Di Mattei.

May 16, No. 59, pp. 627-634

67 *Pelvic Fixation of Uterus for Retroflexion. (Retrofissione uterina e cura alla Pestalozza.) U. Ragusa.

May 18, No. 60, pp. 635-642

68 Fixation of Complement in Pellagra. (Ricerche sulla fissazione del complemento nei pellagrose.) L. Lucatello and M. Carletti.

66. **Cacodylic Acid from Medicolegal Standpoint.**—Cacodylic acid and salts are said to be free from toxicity, but Di Mattei's experiments with ten guinea-pigs, four rabbits and four dogs showed that sodium cacodylate is liable to induce symptoms and lesions showing great analogy with those from poisoning with mineral arsenic, both in the acute and chronic cacodylic poisoning. There was evidently an inflammatory process in both, differing only in its course, the parenchyma of the different viscera suffering the most. The liver and kidney parenchyma showed fat degeneration and necrotic lesions but the suprarenal capsules suffered most, the multiplicity and gravity of the lesions testifying to the fact that the suprarenals have less resisting power than the other organs to the injurious action of the drug. The conditions of the experiments were made to resemble those of the therapeutic administration of the cacodylic acid in the chronic cases, while the other animals were given from 0.15 to 3 gm. of sodium cacodylate at one time, which always proved fatal in less than twenty-four hours after the subcutaneous injection. The symptoms of the acute poisoning corresponded to those from poisoning with organic arsenic.

67. **Intrapelvic Fixation of the Uterus for Retroflexion.**—Ragusa reviews fifty-seven cases in which Pestalozza's technic has been applied to correct retroflexion, and with the best results, by half a dozen gynecologists in Italy and at Pestalozza's clinic. The main feature of the technic is fastening the uterus in its normal position by suturing to the fundus a flap of peritoneum slit from the reflection on the inferior segment of the uterus. The flap includes, besides the strip of peritoneum and the connective tissue connected with it, a few muscular fibers from the external musculature of the bladder. The uterus is thus held in normal position without interfering with its physiologic expansion. All the patients on record have been free from disturbances since, and a number have passed through normal pregnancies.

Policlinico, Rome

May 14, XVIII, No. 20, pp. 617-648

69 *Lumbar Puncture in Treatment of Trauma of the Head. (Terapia dei traumatismi cranio-encefalici per mezzo della puntura lombare.) B. Prampolini.

70 Salvarsan in Syphilis. I. Ullmann. Commenced in No. 19.

71 Intravenous Mercurial Injections in Septicemia. S. de Rossi and others.

May 21, No. 21, pp. 649-680

72 Frambesia. (Frambesia tropicale, buba brasiliana e malattia del Breda.) F. Rho.

73 *Influenzal Ear Lesions. T. Mancioli.

69. **Lumbar Puncture After Trauma of the Head.**—Prampolini reviews twenty-six cases on record in Italian literature in which lumbar puncture was applied in treatment of traumatic lesions of the head, and then reports a case from his own experience which illustrates anew its advantages. His patient was a man of 30 who had fallen on his back, hitting the right parietal-temporal region of the skull. Periods of great agitation alternated with extreme drowsiness and the pupils did not react to light or in accommodation, while the mind did not seem quite clear. There was intense headache in the right parietal region and the spine was tender, but there were no signs indicating fracture of the skull. Lumbar puncture released about 20 c.c. of a turbid, cherry-red fluid, under high pressure, and benefit was soon apparent. A second and third puncture were made the following and the third day, and by the end of nine days after the accident the patient was entirely restored. The trouble had evidently been a contusion of the brain with hemorrhage inducing abnormally high pressure on the brain. The headache and symptoms of irritation subsided completely after the second puncture, and by the third the cerebrospinal fluid was clear and colorless, showing that the extravasated blood had been reabsorbed.

73. **Influenzal Ear Lesions.**—Acute catarrhal otitis media was remarkably frequent, Mancioli states, during the epidemic of influenza at Rome this year, but it generally subsided without suppuration. Primary mastoiditis without involvement of the middle ear was also frequent; he operated in thirty cases of the kind. In each the trouble was a diffuse osteomyelitis rather than an abscess, and in nearly all healing was by primary intention after complete evacuation, removing all the bone involved.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, Los Angeles, June 27-30.

American Academy of Medicine, Los Angeles, June 23-26.
American Ophthalmological Society, New London, Conn., July 11.
American Otological Society, Atlantic City, June 26-27.
American Proctologic Society, Los Angeles, June 26-27.
Arizona Medical Association, Los Angeles, June 26.
Conf. of Bds. of Health of N. America, Los Angeles, June 30-July 1.
Maine Medical Association, Augusta, June 28-29.
Oregon State Medical Association, Los Angeles, Cal., July 10.

AMERICAN GYNECOLOGICAL SOCIETY

Thirty-Sixth Annual Meeting held at Atlantic City, N. J., May 23-25, 1911

(*Continued from page 1747*)

The Frequency and Clinical Significance of Funnel Pelves

DR. J. WHITRIDGE WILLIAMS, Baltimore: In typical funnel pelves the distance between the tubera ischii is reduced to 8 centimeters or less, while the usual measurement remained unchanged. Such pelves were noted in 6.1 per cent. of 2,215 consecutive full-term labors, are of equal incidence in white and black women, and sometimes give rise to serious dystocia. The funnel pelvis is the most common abnormality in white women, in whom it constitutes 44 per cent. of all deformed pelves. In colored women on account of the incidence of the more usual types, it is relatively less important, and stands forth in order of frequency. The prognosis depends not so much on the actual narrowing of the pubic arch or on the distance between the tubera ischii, as on the relation between it and the posterior sagittal diameter. Moderate degrees of dystocia can frequently be overcome by placing the patient in an exaggerated lithotomy or an exaggerated Sims' position. In either event, the antero-posterior and posterior sagittal diameters undergo an average increase of 1.62 cm., which so increases the available space as to make spontaneous labor possible. Such an enlargement affords an explanation for the successful outcome of certain low-forceps operations which appear theoretically impossible from the measurements taken in the usual position. Pubiotomy is the operation of choice in cases of pronounced dystocia, as it not only affects the delivery of the child, but leads to a permanent increase in the size of the outlet, which may be further enlarged by the softening of the fibrous union under the influence of the hyperemia incident to pregnancy, and thus make possible the spontaneous termination of subsequent labors.

DISCUSSION

DR. EDWARD REYNOLDS, Boston: The inferior strait of the pelvis is of vastly more importance than the gynecologist has supposed, and is probably of more importance than the superior strait.

DR. EDWARD P. DAVIS, Philadelphia: In cases of dystocia from funnel-shaped pelvis, when the obstetrician is called in consultation because the family physician cannot secure expulsion of the child, or finds it difficult to extract it, the instrument slipping, and the head of the child being low down, it is the duty of the practitioner to perform craniotomy, as the patient cannot be treated safely in any other way.

Diagnosis and Treatment of Contracted Pelves

DR. J. M. MUNRO KERR, Glasgow, Scotland: The diagnosis of contracted pelvis is not difficult, and the greater the deformity the easier the diagnosis. A careful measurement of the pelvis both by the hand and by a pelvimeter should be made. An estimate of the size of the child's head should be attempted both by palpation and cephalometer. The relative size of the head and pelvis should be estimated, and that should be the basis of treatment. Whenever possible this examination should be made in the thirty-sixth week, and again at the beginning of labor, if the pelvic deformity is of medium degree. One of the most striking features in connection with the treatment of contracted pelvis is the prominence given by all recent writers to spontaneous delivery. Spontaneous delivery is quite frequent with a conjugata vera of 9.3 cm. I have twice seen a child born spontaneously even with a pelvis of 7.5 cm., but no such case has occurred in my clinic during the last two and a half years. In 130 cases of contracted pelvis treated by forceps, the fetal mortality was 50 per cent., with a conjugata vera of 7.5 cm., 33 per cent. with a conjugata vera of 8.1 cm., and 15 per cent. with a conjugata vera of 8.7 cm. I have performed craniotomy seventeen times in the last two and a half years. I have done a pubiotomy three times, and symphyseotomy once. All these patients did well, and all the children did well. I consider pubiotomy an excellent operation, but it has a very limited field. Cesarean section is dangerous in suspect cases. In these cases the maternal mortality is 17.3 per cent., and if frequent examinations have been made it runs up to 34 per cent. If Cesarean section is performed in the suspect cases, undoubtedly the best results have been obtained by removing the uterus. What will lower the mortality and morbidity, both maternal and fetal, more than anything else is a more thorough training of students and young graduates to appreciate the importance of an early diagnosis of pelvic deformity and the limitations of every operation which may be employed.

DISCUSSION

DR. J. WHITRIDGE WILLIAMS, Baltimore: In the 2,200 cases which I discussed in my paper on funnel-shaped pelves, there were 16 per cent. of spontaneous deliveries in all classes of inlet contractions in white women as compared with 81 per cent. in black women.

DR. A. LAPTHORN SMITH, Montreal: The tendency to hurry matters in these cases is a curse rather than a blessing, and it comes about very largely from conditions peculiar to this country. In America the doctor is told to hurry up or the woman will get somebody else, and it is this hurry-up spirit which makes it difficult to instill into the mind of the young doctor the important point that he must not hurry delivery until the time comes for it to be effected.

DR. RICHARD C. NORRIS, Philadelphia: My attitude toward inducing labor in properly selected cases not more than two or three weeks before the calculated term will add to the table of spontaneous deliveries of the essayist. It is in this class that induced labor should be considered. The question of transperitoneal and intraperitoneal Cesarean section has never appealed to me. I believe that craniotomy is yet a conservative operation, which must be used in certain instances. I have twice in the past year been called on to perforate the head of the living child.

DR. HENRY D. FRY, Washington, D. C.: In Washington we have a large colored population, and I have noticed in examining a large number of pelves that fully 50 per cent. of the women have justo minor pelves. It is rather unusual for me to find in colored women a rachitic flat pelvis. In the white woman the justo minor pelvis is rather unusual, and the simple flat and rachitic flat pelves are more common. As to spontaneous labor, in the cases I have seen it has occurred in 60 or 70 per cent. of them.

DR. JOHN O. POLAK, Brooklyn: My results from premature labor have been unsatisfactory. The fetal mortality has been considerable, and it has subjected my patients to the possibilities of infection. My associate and I have done Cesarean section in sixty-one cases without a death, and many of these patients were handled and brought in off of the ambulance after several attempts at delivery with forceps had been made. We have had no difficulty in delivering these women, and they have had no marked morbidity, and no mortality.

DR. ROBERT L. DICKINSON, Brooklyn: There is a large field for the induction of labor. I do not allow primiparæ to run overtime unless they have been well starved. Starvation and early delivery have given me successful results so far as the fetal death-rate is concerned.

DR. EDWARD P. DAVIS, Philadelphia: With reference to Cesarean section, when a woman has had the test of labor and has a contracted pelvis, one need not necessarily wait for labor, but should resort to Cesarean section and in clean cases one will get good results.

Salpingostomy in Pregnancy

DR. GEORGE GELLHORN, St. Louis: The occluded tubes are extirpated by the majority of operators. In a minority of instances, however, where the patient desires offspring, salpingostomy may be performed with safety. I operated in a case removing the left adnexa and splitting open the right tube. The patient gave birth to a healthy child three and a half years later and is about to be confined for the second time.

To prevent the recurrence of occlusion after salpingostomy, appropriate after-treatment is necessary, mainly the use of high degrees of dry heat. If the plastic operation is thus restricted, the patient will suffer no ill effects, even though a certain percentage of the tubes may again become sealed.

DISCUSSION

DR. THOMAS J. WATKINS, Chicago: I have recently been interested in the technic of salpingostomy, having had trouble in making an artificial opening in the tube to avoid constricting it. Even in cases where the incision is made parallel, where the mucous membrane is turned over into the serosa and stitched, after the operation is completed, the opening is surprisingly and disappointingly small. Of late I have modified the technic, making a longitudinal incision, beginning at the distal end of the tube and suturing the mucous membrane on either side of the ovary, and in that way offering hope of not constricting the tube and of its not becoming occluded. I recall one case of opening the tube where pregnancy took place. This was a case of infection due to induced miscarriage. Gonorrhea was excluded. Examination of the husband proved there were spermatozoa. These tubes were both opened through an anterior vaginal incision. The woman bore a child afterward, and had a tubal pregnancy later, and at the time of the tubal pregnancy the opposite tube was found normal, except that there were a few adhesions about the fimbriated end.

DR. FRANKLIN H. MARTIN, Chicago: For three or four years, instead of doing salpingostomy in these slightly saeculated cases, I have been in the habit of employing a method of opening the tubes and rendering them patulous by means of hydrostatic pressure. Any tube that will hold from ten minims to half an ounce of fluid should be treated in this way. The tube is brought to the surface, and, after being liberated from adhesions, is placed on a thick laparotomy gauze sponge, and then the tube is milked in the direction of the fimbriated end. Almost every one of these tubes will rupture at the fimbriated end, opening up the tube along the fimbria, and at the same time causing evacuation of the tube.

DR. J. WESLEY BOVÉE, Washington, D. C.: I have done several salpingostomies. I have had one case of pregnancy, and this was ectopic.

DR. ROBERT L. DICKINSON, Brooklyn: I have spread the tube on the ovary in sixteen or eighteen cases and dropped it.

Salpingitis

DR. FRANK T. ANDREWS, Chicago: Salpingitis is not a disease by itself. It is a part of a general pelvic inflammation. The field of action is not the pelvis alone. Pelvic inflammation, in the majority of cases, begins as an acute vulvar or vaginal or uterine infection with a tendency to spread through the tubes to the pelvic peritoneum. The infecting agent may be the gonococcus; streptococcus, members of the colon bacillus group, pneumococcus and staphylococcus. Each variety has many grades of virulence and varies in the intensity of its virulence. Patients differ in their power to resist or combat infection, and this resistance is not a fixed state, but changes constantly during the progress of the disease. If, with reasonable certainty, within a reasonable time, we can cure by vaccines, then operation is criminal. It is understood that vaccines are contra-indicated in the acute stages of this or any other pyogenic process. The toxins are already in excess in the tissues, and to add more would be folly. Furthermore, no efficient antitoxin has as yet been produced for the toxins of the pyogenic organisms. This leaves, then, the chronic form to be considered, and it is known that chronic gonorrhea and other pyogenic infections are often cured by vaccines. Then why may we not use autogenous vaccines in cases of salpingitis? One limitation to their use is to be found in the anatomic relations of the Fallopian tube to the pelvic peritoneum. Each injection is followed by a decided reaction. Such reaction is marked by an increase in the intensity of inflammation in every infected part, meaning much local peritonitis with its usual results, and perhaps a diffuse peritonitis with death. Another danger in cases such as these in which spontaneous auto-inoculations are taking place is that the spontaneous inoculation or rupture of the tube may occur soon after an inoculation with autogenous vaccine. The effect of this will be the same as of a greatly increased dose of the toxin in a patient with acute exacerbation of the pelvic trouble. That is, the effect of the vaccine will be greatly to increase the severity of the acute attack. I believe that treatment by immunization has almost infinite possibilities for the future, but that the present state of our knowledge does not warrant us in experimenting on our patients. The battle will be won only when we can produce immunity with impunity.

DISCUSSION

DR. SETH C. GORDON, Portland, Me.: Pyosalpinx was very much more common years ago than it is now. I operated on most of these cases through the vagina, making a thorough incision and establishing drainage, and nearly all those patients got well.

DR. EDWARD REYNOLDS, Boston: In many cases of chronic vaginal discharge, as soon as the tubes are dealt with, the vaginal discharge decreases. I am inclined to believe it is due to the probability that in chronic salpingitis there is a passage downward of small quantities of discharge or of a ferment, which, on emerging into the uterus or vagina, keeps up a much more profuse discharge in the larger passages, the tubes acting as reservoirs for the ferment, and that increasing the vaginitis, and after its removal the tubes are clear. It is difficult for me to see how we can expect any very large percentage of cures in these chronic cases of salpingitis by vaccination, when one remembers the physical state in which most of these tubes are left.

DR. T. J. WATKINS, Chicago: Dr. Andrews' paper is along the line of developing immunity, and he has said that a patient does not get well because the local disease gets better, but the local disease gets better because the patient develops a general immunity. And this has been the idea in the treatment of pelvic infections. Now, the gynecologist does everything he can to develop immunity. He has found that if he drains a pus tube or takes it out in the most surgical manner without spilling the pus, the patient's temperature is not shortened. The patient runs a fever for two or three weeks, probably a little longer with an operation than without it, because the amount of bacteria and poison removed by the operation is less than the amount of physiologic resistance cut down as the result of the operation. So in these cases the surgeon has very much to be thankful for in this contest between physiologic resistance and bacterial invasion.

Double Ovarian Dermoids in Pregnancy

DR. WALTER P. MANTON, Detroit: In the total number of cases collected there were twenty-seven double tumors noted in the non-gravid, and seventy-three single, and nineteen double, associated with pregnancy. In the non-gravid, twenty-three tumors were situated on the right side, and sixteen on the left. In the pregnant, of the single growths, eleven were on the right and ten on the left side. From the fact that, even with double tumors, menstruation is unaffected, or shows only slight disturbances late in the disorder, it appears that these growths have little influence on that function, and from the number of reported pregnancies do not, as a rule, prevent conception. On the other hand, their existence is always a menace to the health and even life of the mother during pregnancy, and especially following delivery, from the peculiar liability of dermoids to twisting of the pedicle, and in occasional instances during gestation, to the pressure caused by the size and position of the associated cyst. The coincidence of other new growths of the pelvic organs and dermoid cysts adds still greater danger to the maternal host, the two morbid products not infrequently becoming formidable complications in pregnancy, labor, or the puerperium. In thirty-one selected cases, there are noted as associated conditions: ovarian cyst in

seven; par-ovarian cyst in two; ovarian fibroids of the opposite side in one, and uterine fibroids in seven. Malignancy was found present in the walls of the dermoid itself in twenty-four cases, a number sufficient to warrant a more careful investigation of these growths in the future. Moreover, suppuration is exceedingly liable to occur in these cysts, and fatal termination from infection has been reported in not a few cases.

DISCUSSION

DR. GEORGE GELLHORN, St. Louis: I know of an interesting case which occurred in the practice of Dr. Ehrenfest, which I would like to relate briefly. A young married woman, during her first pregnancy, had to be examined, and the presence of a tumor was determined. Laparotomy was performed during the fourth month of pregnancy, and a cyst removed, which was found to be a dermoid. On the other side there was a smaller cyst of exactly the same nature. But, as experience has taught that the removal of both ovaries during pregnancy threatened to terminate pregnancy, the second smaller ovarian dermoid was left behind. The family desired more children, and so the second ovary was not removed. The first pregnancy terminated normally, but the woman is kept under constant control. This woman has borne a second child since, and is now being watched closely to see if she may possibly have a third child, after which the dermoid cyst will be removed to prevent the possibility of carcinomatous degeneration.

DR. T. J. WATKINS, Chicago: With a double dermoid it would seem very feasible simply to leave a part of the tumor which retains the corpus luteum, and this probably will prevent the interruption of pregnancy.

DR. BROOKS H. WELLS, New York: The removal of these ovaries during pregnancy does not interrupt pregnancy. I recall a case in which there were two dermoid cysts of both ovaries, which were removed, the patient being advanced four months in pregnancy and went on to term.

DR. W. P. MANTON, Detroit: I have never had a case in which I have operated on both sides during pregnancy, removing the dermoids. In all reported cases in which the dermoid is on one or both sides, pregnancy has gone on uninterrupted. The majority of operators advocate leaving behind a portion of an ovary.

The Blood-Supply of Uterine Myomata

DR. JOHN A. SAMPSON, Albany, N. Y.: The main intrinsic uterine arteries, to which the name arcling may be given, penetrate the anterior and posterior uterine walls and lie between the outer and middle third. Their course is horizontal in the lower portion of the body of the uterus and obliquely horizontal (upward), as one approaches the fundus. Each arcling artery terminates in a medial, radial or centripetal and peripheral branch, the latter often anastomosing with a similar branch of the opposite arcling artery, thus establishing a communication between the two main arteries. All along the course of each arcling artery, radial branches arise which terminate in the endometrium, and also peripheral branches arise which nourish the myometrium. Sections of injected uteri containing myomata show that all tumors of an appreciable size have an arterial blood-supply which varies greatly in different specimens and in the larger tumors is frequently greater than that of the myometrium. The same sections fail to demonstrate any veins in many of the tumors; in others a few small veins may be seen throughout the tumor or about its periphery, while occasionally they are quite evident, but never as abundant as in the myometrium. The extrinsic and intrinsic arterial supply of these tumors explains many of the clinical phenomena. I can readily understand why these tumors may be shelled out from the uterine wall with slight bleeding occurring only in a few places. Tumors in which veins are found in their substance and about the periphery suggest that the change between arterial and venous blood occurs within the tumor; in those in which veins are not found it is impossible to demonstrate where this takes place. The regressive changes in these tumors, calcareous deposits, and necroses, are in many instances due to alterations in the vascularity of the tumor as a whole or a portion of it.

(*To be continued*)

Book Notices

PUERPERAL INFECTION. By Arnold W. W. Lea, M.D., Lecturer in Obstetrics and Gynecology, the University, Manchester. Cloth. Price, $9. Pp. 384, with illustrations. New York: Oxford University Press, 1910.

The author has undertaken to describe the etiology, bacteriology and pathology of puerperal infection with as great scientific accuracy as possible and at the same time to keep in mind the practical and clinical aspects of the various types of infection, giving with clearness and fulness the modern methods of diagnosis and treatment. In this attempt he has succeeded in giving a clear picture of this complex subject and has inspired confidence in his practical direction for treatment by his conservative views. After a short historical review and a short chapter on definitions, follows a brief discussion on frequency, mortality and morbidity in England, Germany and the United States. Unnecessary operative interference is rightfully blamed for the continuance of a high morbidity and mortality.

The difficult subject of etiology is concisely but well handled. The bacteriology of the female generative tract, during both normal pregnancy and the puerperium and in infection, is followed by a discussion of the conditions predisposing to infection and the important question of heterogenous versus autogenous infection. The influence of examinations and operative procedures in increasing the danger from the vaginal organisms is spoken of, while the slight pyrexias in the early days of the puerperium following well-conducted labor is attributed to autogenetic infection. The chapters on general pathology and pathologic anatomy are brief but clearly written and profusely illustrated. The uncertain state of our knowledge concerning toxemia and septicemia and the importance to be attributed to the hemolytic function of streptococci is shown by the author in his treatment of this unsatisfactory subject in the chapter on symptomatology. He gives correctly what is known, but the impossibility of distinguishing clearly between toxemia and septicemia is shown. The localized infections are satisfactorily pictured.

In the important chapter on prophylaxis the subject of the disinfection of the vagina is thoroughly discussed and while the author agrees with the majority of teachers in omitting the vaginal douche in normal cases he advises it in prolonged labor, in cases of purulent vaginitis, in cases of intrapartum fever and in all operative deliveries. Good rules for hand disinfection are given. Unfortunately, he seems to discourage the general use of gloves by emphasizing the drawbacks attending their use. He gives observations of Ahlfield and Walthard concerning the favorable influences on the puerperium of a long third stage of labor, but unwisely admits that it is quite impossible to wait one hour in private practice for the delivery of the placenta. The advice to remove portions of retained placenta is not carefully enough limited to avoid risk from the dangerous manipulation. The recommendation of a 2 per cent. solution of liquor cresolis compositus for an intra-uterine douche is dangerous advice.

Nearly one-third of the book is properly devoted to treatment. The general principles of isolation, rest, drainage and non-interference, except when absolutely necessary, are inculcated. In carrying out the latter in local infection the author does not take a decided stand, but, after stating the position of Kronig, Winter and others who abstain from all local treatment, he describes the various means of using antiseptics by douche and other topical treatment, likewise the technic of tamponade, finger curettage, *écouvillonage*, which is favored by the author, and curettage is fully described. The conclusions reached concerning the latter procedure are in general fairly conservative. Hot vaginal douches and hot air are preferred to cold applications in localized pelvic inflammation.

Some criticism might be made of certain details of the measures of general treatment which are not free from exploded ideas that have been handed down from uncritical times. We cannot agree that beef teas and meat extracts are of great value. Enemas of milk, eggs and beef tea cannot be given every four hours for any considerable period of time. The term "high enema" is bad if it implies the com-

mon but often refuted error that the rectal tube can be inserted into the colon. "Firm pressure" to check the secretion of milk is not necessary and of doubtful efficiency.

In the section on methods of destroying organisms and neutralizing toxic products in the blood and tissues of the body, the author is favorable to the collargol treatment and advises its general use. He seems to be ignorant of the investigation of the Council on Pharmacy of the American Medical Association. Phagocytin is unnecessarily given some space, since at the end of the paragraph the author says that further experiments failed to show that it exerted any favorable therapeutic influence.

The present state of the therapeutic use of the abscess of fixation is given without any recommendation by the author concerning its value. The intravenous injection of dilutions of formaldehyd solution is mentioned as having been tried in America with apparent success. A little further investigation of American literature would have shown that this dangerous experiment had a very ephemeral success. Serotherapy is judiciously discussed and the conclusion reached that its value is very questionable. Immunization by vaccines is likewise described and a more favorable view of its value obtained.

The indications for and the method of operative treatment of localized pelvic infection and of peritonitis are given with sufficient fulness. Hysterectomy is found indicated in cases of injury with infection and in some localized infections with abscess, in infected myoma and rarely in retention of fetus or placenta. Ligation of the pelvic veins is rarely indicated.

The book closes with a summary of treatment of both localized and general infection. It is a concise statement of the views of the author and worthily closes a laudable undertaking.

THE DAWN OF THE HEALTH AGE. By Benjamin Moore, D.Sc., M.R.C.S., L.R.C.P. Cloth. Price, $1.40 net. Pp. 204. London: J. & A. Churchill (Philadelphia: P. Blakiston's Son & Co.), 1911.

This book is another evidence of the growing popular interest in health topics. While written by an Englishman, it applies to conditions in the United States as well as in Great Britain. The author endeavors to demonstrate the necessity for an entire remodeling of the present system of medical service in the interest of the whole community, by showing that thousands of lives and millions of money can be saved every year if disease is attacked on scientific principles "instead of being dallied with as at present." Dr. Moore advocates a system of state medicine by which competent physicians are made officers of the state for the suppression of disease, as police officers are employed for the suppression of crime. The author has evidently a strong tendency toward state socialism. Great Britain is apparently farther advanced along this line than the United States, as is shown by existing British laws regarding invalidity insurance, employers' liability, care of the sick by the state, workingmen's insurance, etc. While one may not agree with all of the conclusions, the book is interesting and suggestive. Chapters on the follies of present public health service, the doctor and his patient in private practice and in state practice, the evils and abuse of hospital systems and the evolution of a national medical service contain the basic facts and theories from which the proposed system of the writer is developed. Evidently the advocates of public health reform in England have encountered the same opposition as that met in this country, as is shown by the comments of the author on the objection that such a plan would be an invasion of personal liberty. He says, "Let us next look at the matter from the point of view, so often called in evidence by opponents, of the sanctity of the home and the intrusion on it of an army of officials. This is an ancient bogey which was taken out of its cupboard, carefully dusted and filled with fresh straw to alarm the British workman and voter when free education was granted him for his children. He was then told that his hereditary castle was gone forever and that he would have no peace or quiet with his wife and family on account of the unwelcome and prying visits of the school attendance officer haling poor little Johnnie away to school as to some prison or torture chamber. Now is it so in fact, after a good many years of reign of the school board? Is this reign really a reign of terror? Is the school attendance officer an irksome person in constant attendance at the poor man's home? No; he is only a terror to those, and they are but a small percentage, to whom he ought to be a terror and to whom we would all wish him to be a terror, who would neglect their children in a wicked and criminal way. . . . These officers, although they visit homes, have no more terrors for honest people than either the policeman or the gas-meter inspector." In another chapter he says, "Under the new regime, medical treatment will be as free to everyone as is the school and education to-day and everyone must accept medical treatment in his own interest and that of the community just as he must to-day accept education for his child whether he wants it or not." Dr. Moore has presented an interesting argument for advanced constructive health legislation.

PUBLIC HYGIENE. By Thomas S. Blair, M.D., Neurologist Harrisburgh, Pennsylvania, Hospital. Assisted by Numerous Contributors. In Two Volumes. Volumes I and II. Cloth. Price, $10 net. Pp. 644, with 158 illustrations. Boston: Richard G. Badger, (1911).

The growing interest in public hygiene would seem to warrant the preparation and publication of a comprehensive work on this subject, adapted to the needs of the general practitioner and the lay worker in sanitation reforms. Such a book is greatly needed and on first inspection Dr. Blair's book seems to meet the indications. More careful examination, however, arouses the suspicion that the material for this work was hastily put together and that too little time has been given to the processes of digestion and condensation. Frankly, the impression left on the mind of the critical reader is that material for a single, compact volume has been padded out to form two and that much material has been given place in full, which could better have been summarized or abstracted and that undue haste has been used in getting the work out. The two volumes are copiously illustrated, the plates being well executed from a mechanical standpoint, but not always having a discernible connection with the text. For instance, it is difficult to see the value in a work on public hygiene of a photograph of the elevator entrance to the rest-room of the Waldorf Astoria Hotel. Large photographs of the exteriors of public and private institutions are also of no discernible value. The binding is lacking in stability.

A BRIEF TEXT OF PHYSIOLOGY. For Dental, Pre-Medical, and College Students. By Carl J. Wiggers, M.D., Department of Physiology, University of Michigan. Cloth. Price, $1.50. Pp. 207, with 47 illustrations. Ann Arbor: George Wahr.

This manual was originally intended for the use of dental students at the University of Michigan. It is an effort to cover the essentials of human physiology within the limits of the physiologic course given in dental schools. Only subjects of the greatest general interest have been included and discussions on debatable questions have been largely supplanted by statements of that side which to the author seemed to have the preponderance of evidence. It is rather more elaborate than a quiz-compend and is really a digest of present physiologic knowledge. A supplement contains directions for a number of experiments of use in demonstrating physiologic principles, space being left between the directions for each experiment, for the student to use in writing up laboratory notes.

THE INTERNATIONAL MEDICAL ANNUAL. A Year-Book of Treatment and Practitioner's Index. 1911. Twenty-Ninth Year. Cloth. Price, $3.50. Pp. 748. New York: E. B. Treat & Co.

This year-book, in its twenty-ninth year, is fully up to the standard of former editions. In it is given a comprehensive review of the year's work in treatment, covering practically the whole field of medicine and surgery in all their branches. A new feature is an index of the matter contained in the section on "Therapeutics" under the names of diseases in the section "Dictionary of New Treatment." This prevents the reader from missing new remedies (largely proprietaries, by the way) or a particular form of treatment which has not found its way into general use. The book is well illustrated, having a number of good colored plates.

GENERAL INDEX

All *reading matter* in THE JOURNAL from January to June, 1911, inclusive, is indexed here. (For Current Medical Literature Index see pages 1948 to 2000). "Deaths," "Book Notices," and "Society Proceedings" are indexed under these titles at the ends of the letters "D," "B" and "S." Matter pertaining to the Association is under "American Medical Association." With the above exceptions, all matter is indexed under the most important word of the heading that was used in THE JOURNAL, and also under the subject heading. For instance, abscess of brain will be found indexed under "abscess" as well as under "brain." Such titles as "ocular manifestations, etc.," have been indexed under "eye." Cross-references have been made wherever this was possible. It is also well to remember that, in looking up a certain subject, related words should be consulted, for example, chest, thorax; skull, cranium; bowel, intestines. The letters used to explain in which department the matter indexed appeared are as follows: "E" editorial; "O" original article; "C" correspondence; "T" therapeutics; "MI" medicolegal; "P" pharmacology; "M. E." medical economics, and "ab" denotes an abstract of an article that has appeared in full elsewhere. *Names of authors* of original articles appearing in THE JOURNAL are not given in this index, but are included in the Index of Authors.

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SOCIETIES

Abbreviations:
Acad.—Academy.
Am.—American.
A.—Association.
Conf.—Conference.
Cong.—Congress.
Hosp.—Hospital.
Internat.—International.
M.—Medical, Medicine.
Pharm.—Pharmaceutical.
Phys.—Physicians.
Ry.—Railway.
S.—Society.
Surg.—Surgical, Surgery, etc.

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CURRENT MEDICAL LITERATURE

INDEX TO SUBJECTS

Explanation: The *reading matter which appeared in* THE JOURNAL *is not indexed here*, except the original articles and the abstracts of original articles. This index refers to the titles and the subjects of original articles published in the leading medical journals of the world, including THE JOURNAL, during the past six months. The titles of the articles and the names of the journals in which they appeared were listed weekly in the Current Medical Literature Department, and it is to them that references are here made. The figure in parentheses refers to the paragraph; the number following to the page in THE JOURNAL. For instance, "Immunity, Studies on, in Cancers of White Rat, (76) 1512—ab," refers to page 1512 of THE JOURNAL, on which is found, in paragraph 76, the title of the paper and the name of the author, viz., "Studies on Immunity in Cancers of White Rat, I. Levin and M. J. Sittenfield." This title is listed under the journal in which the article appeared, the *Journal of Experimental Medicine*, May, 1911. When "ab" follows a page number it indicates that the article was abstracted in THE JOURNAL; for instance, "Pylorus, Congenital Stenosis of, (85) 697—ab." On page 697, paragraph 85, will be found an abstract of this article, which appeared in *American Journal of Diseases of Children*, February, 1911. Titles of articles which appeared originally in THE JOURNAL are indicated in the index by an asterisk (*) before the page number; for instance, "Breast, Cancer of, Operative Treatment of, *315," refers to page 315 of THE JOURNAL, on which is found the complete original article. The index to authors of all articles, both original and those listed under Current Medical Literature, appears separately on pages 2001 to 2016 of this Index.

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NEW AND NONOFFICIAL REMEDIES, 1911

THIS BOOK contains the medicinal substances which, prior to Jan. 1, 1911, have been examined by the Council on Pharmacy and Chemistry of the American Medical Association, which appeared to comply with the rules of the Council and which therefore were accepted for inclusion in the annual "New and Nonofficial Remedies." The acceptance of the articles included in the book has been based in part on evidence supplied by the manufacturer or his agent, and in part on investigation made by or under the direction of the Council. Criticisms and corrections to aid in the annual revision of the matter are requested.

The Council desires physicians to understand that the acceptance of an article does not necessarily mean a recommendation, but that so far as known it complies with the rules adopted by the Council.

This book is issued annually. During the year descriptions of further medicinal substances accepted by the Council for inclusion in "New and Nonofficial Remedies" will be published in THE JOURNAL from time to time.

W. A. PUCKNER, Secretary.

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OFFICIAL RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY

Introduction.

Object of the Rules.—The following rules have been adopted by the Council with the object of protecting the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicinal articles.

Contents of N. N. R. The "N. N. R." contains a description of such proprietary articles as have not been found to conflict with the rules of the Council; and of such simple non-proprietary and unofficial substances as seem of sufficient importance.

Attitude on Mixtures. Proprietary pharmaceutical mixtures should comply with the rules and will be investigated by the Council. The Council, however, endorses the principle that prescriptions should be written on the basis of the therapeutic effects of the individual ingredients. For this reason, it does not include mixtures in this book unless they present some real advantage. If, however, the physician wishes to prescribe ready-made proprietary mixtures, he will find in the appendix, listed under the name of the manufacturer, those proprietary mixtures which on examination have not been found to conflict with the rules.

Non-proprietary Mixtures. Non-proprietary mixtures share the status of the substances from which they are prepared, and therefore are not contained in the book.

Rules Governing the Admission of Proprietary Articles to the Book, "N. N. R."

Definition of Proprietary Articles.—(The term "proprietary article," in this place shall mean any chemical, drug or similar preparation used in the treatment of disease, if such article is protected against free competition, as to name, product, composition or process of manufacture; by secrecy, patent, copyright, or in any other manner.)

Rule 1.—Composition.—No article will be accepted for inclusion with "New and Nonofficial Remedies" unless its composition be furnished to the Council for publication. For simple substances the scientific name and the chemical formula, rational or structural if known, should be supplied. For mixtures the amount of each active medicinal ingredient in a given quantity of the article must be stated. The general composition of the vehicle, its alcoholic percentage, and the identity of the preservatives, must be furnished.

Rule 2.—Identity.—No article will be accepted unless suitable tests for determining its composition are furnished to the Council. In the case of chemical compounds these shall consist of tests for identity and purity. In the case of mixtures, methods shall be furnished for determining the amount and active strength of the potent ingredients if practicable.

Rule 3.—Direct Advertising.—No article that is advertised to the public will be admitted; but this rule will not apply to disinfectants, advertised for uses other than on the human body, or to non-medicinal food preparations, except when advertised in an objectionable manner.

Rule 4.—Indirect Advertising.—No article will be admitted whose label, package or circular accompanying the package contains the names of diseases, in the treatment of which the article is said to be indicated. The therapeutic indications, properties and doses may be stated. (This rule does not apply to vaccines and antitoxins, or to directions for administering or applying remedies where similar immediate, heroic treatment is indicated.)

Rule 5.—Fraudulent Claims as to Origin.—No article will be admitted or retained concerning which the manufacturer or his agents make false or misleading statements as to source, raw material from which made, or method of collection or preparation. The identity of the actual manufacturer of the article must be furnished.

Rule 6.—Unwarranted Therapeutic Claims.—No article will be admitted or retained concerning which the manufacturer or his agents make unwarranted, exaggerated or misleading statements as to the therapeutic value.

Rule 7.—Poisonous Substances.—The principal label on an article containing "poisonous" or "potent" substances must state plainly the amount of each of such ingredients in a given quantity of the product.

Rule 8.—Objectionable Names.—If the trade name of an article is not sufficiently descriptive of its chemical composition or pharmaceutical character, or is, for any other reason, unsatisfactory or objectionable, the Council reserves the right to include with the trade name a descriptive title in the book. Articles bearing objectionably suggestive names will be refused consideration. Names which suggest diseases, pathologic conditions or therapeutic indications will not be admitted. In the case of pharmaceutical preparations or mixtures the trade name must be so framed as to indicate the most potent ingredients.

Rule 9.—Patented Products and Protected Names.—If the article is patented—either process or product, or both—the number of such patent or patents should be furnished to the Council. Furthermore, if the name of an article is registered, or the label copyrighted, the registration (trade-mark) number and a copy of the protected label should be furnished the Council. In case of registration in foreign countries the name under which the article is registered should be supplied.

Rule 10.—Unscientific and Useless Articles.—No article will be admitted which, because of its unscientific composition, is useless or inimical to the best interests of the public or of the medical profession.

Explanatory Comments on the Rules.

Introduction.—*History, Purpose, and Method.*—The Council on Pharmacy and Chemistry was established in February, 1905, by the American Medical Association, primarily for the purpose of gathering and disseminating such information as would protect the medical profession in the prescribing of proprietary medicinal articles. In pursuance of this object the Council examines the articles on the market as to their compliance with definite rules which are designed to prevent fraud, undesirable secrecy and the abuses which arise from advertising to the laity. Such articles as appear to conform to the rules are admitted and their essential features are described in the annual publication of the Council, the "N. N. R.," if they come within the scope of this book.

Submitted Evidence.—This description is based in part on investigations made by or under the direction of the Council, but in part also on evidence or information supplied by the manufacturer or his agents. Such interested statements are examined critically, and are admitted only if they appear to be in conformity with the evidence. It is, however, manifestly impossible for the Council to investigate the composition of every complex pharmaceutical mixture, or thoroughly to check every therapeutic claim; it can only give an unbiased judgment on the submitted evidence. Criticisms and corrections of the descriptions which may aid in the revision of the matter will be appreciated.

Previous Infringements and Fraud.—The Council judges an article entirely by the facts existing at the time of its admission. Previous infringements of the rules (short of *intentional* fraud) do not prevent the favorable consideration of an article, provided that they have been thoroughly corrected.

Reconsideration.—Infringements after admission, or the discovery that the Council's information was incorrect, will cause the acceptance to be reconsidered.

Acceptance Not an Indorsement.—The Council desires physicians to understand that the admission of an article does not imply a recommendation. It means only that no conflict with the rules has been found by the Council.

The Scope of the "N. N. R." and Appendix.—To aid physicians and manufacturers in deciding what articles come within the scope of this book, or, in other words, to enable physicians to recognize whether an article has been omitted because it does not need admission or because it has been rejected, the Council furnishes the following more detailed definitions:

Official Articles.—The status of the articles which are official in the United States Pharmacopœia or in the National Formulary naturally does not require the approval of the Council. Since authoritative information concerning them is readily obtainable, they have no place in the "N. N. R."

Nomenclature.—To avoid confusion with non-official substances marketed under similar names the Council recommends that they be prescribed by their official Latinized title, followed by the abbreviation, "U. S. P." or "N. F.," thus: Tincturæ Nucis Vomicæ U. S. P. 5 Cc., Elixir Gentianæ N. F. 95 Cc.

Trade Names. Priority. Imitations of Official Articles. "Trade names," protected or otherwise, for these articles will not be

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recognized by the Council unless they antedate the recognition of the article in the United States Pharmacopœia or National Formulary. Nor will non-essential modifications of official or non-proprietary preparations be recognized. Essential and important modifications, however, will be accepted and will receive individual mention in the "N. N. R."

SUBSTANCES DESCRIBED IN THE "N. N. R."—In the body of the book will be described simple proprietary substances and their preparations when these are marketed by the original manufacturer; proprietary mixtures if they have originality or other important qualities which entitle them to such place; and important non-proprietary unofficial articles.

Suffix "N. N. R."—The Council recommends that when these latter are prescribed, they be indicated by the abbreviation, "N. N. R." thus insuring to the prescriber the quality of these articles laid down in the book.

PROPRIETARY MIXTURES.—*Definition.*—A mixture will be considered as proprietary, and therefore requiring consideration by the Council and admission to the book or appendix, if it contains any proprietary article; if it is marketed under a name which is in any way protected; or if its manufacturer claims for it any unusual therapeutic qualities.

Where Listed.—All proprietary mixtures which are marketed in conformity with the rules are listed in the appendix of the "N. N. R." under the names of their manufacturers. They are not admitted to the body of the book, save in the exceptional cases cited in the preceding paragraph.

NON-PROPRIETARY MIXTURES OF OFFICIAL SUBSTANCES.—Since the ingredients of such mixtures do not require the approval of the Council, and since the mixtures are not open to the proprietary abuses which called for the work of the Council, it is not necessary that they should be investigated and approved by the Council. The physician should judge whether such mixtures should be directed to be prepared by the pharmacist, or whether he is justified in ordering a ready-made preparation. If he decides to use a ready-made non-proprietary preparation he must judge for himself if it is marketed in accordance with the rules.

Trade Names.—It should also be remembered that the application of trade names to any substance makes it proprietary.

Objectionable Trade Names for Official Substances.—The application of "trade names" to official or established non-proprietary products tends to confusion and fosters many abuses. It can only be condoned if the "trade name" possesses priority as previously defined. Such trade names will therefore not be admitted by the Council except in those few cases in which the trade name has already come into extensive use.

Use of Firm Names.—The protection of the manufacturers can be amply secured by appending the firm or "brand" name to the official name, and to this there can be no objection. Appended names or initials of manufacturers as in Mistura Rhei et Sodæ, X. Y. & Co.; Mixture of Rhubarb and Soda, "Jones;" Pills of Aloes and Iron, "Smith brand," are considered non-proprietary.

Generic Names.—Protected generic brand names shall not be regarded as proprietary. However, the preparation "Adrenalin suppositories" is proprietary because the name adrenal itself is protected.

UNESSENTIAL MODIFICATIONS OF OFFICIAL SUBSTANCES.—*Imitations.*—The subterfuge for obtaining proprietary rights over an official or established non-proprietary product, by introducing unessential modifications, also tends to confusion and abuses, and such articles will not be admitted by the Council. Essential and important modifications, however, will receive recognition. (The Council interprets the term "established non-proprietary product" to apply to a preparation of any formula which has been published through any recognized or reasonably accessible channel of publication, prior to its appropriation or modification by a manufacturer.)

EXPLANATORY COMMENTS ON THE RULES GOVERNING THE ADMISSION OF PROPRIETARY ARTICLES.

Rule 1.—COMPOSITION.—*Secrecy Objectionable.*—It is not only the right but the duty of the physician to know the essential composition of what he prescribes; the Council cannot compromise on this proposition.

Vehicles and Preservatives.—In the case of mixtures not only the potent ingredient, but also the general character of vehicle, the presence of alcohol, and the identity of preservatives, or of any other substance, whether added or present as an impurity, must be stated, if these can under any circumstances affect the action of the article. This generally does not mean the publication of such trade secrets as flavors or the details of the working formula.

Trade Secrets.—Furthermore, trade secrets will not be received as confidential by the Council, since it accepts information only with the distinct understanding that this may be freely published, at its discretion.

Inspection of Factories.—Nor does the Council accept invitations to inspect factories; its concern is with the finished products.

On the other hand, the Council requires that the information be complete and accurate as to the medicinal ingredients.

Unofficial Constituents.—Unofficial constituents of proprietary mixtures must be submitted by the manufacturer in the regular way and must be approved by the Council before the preparations containing them can be admitted.

Fraud.—When it appears that a manufacturer has made a *deliberately* false statement concerning his product he is asked to furnish an explanation; and if this is not satisfactory the product will not be admitted, even if the false statement is subsequently corrected or omitted.

Testimonials.—This applies not only to statements made to the Council, but also to statements furnished to physicians by the manufacturer or his agents, even when these statements are in the guise of testimonials.

Rule 2.—IDENTITY.—In order to avoid errors in the case of chemical compounds, and to guard against adulterations, lack of potency or strength and the mistaking of one chemical for another, it is necessary to have at hand suitable tests.

Tests, etc.—If these facts have appeared in the literature, or in standard text-books, reference to them will be sufficient; but with new chemicals, especially synthetics, the manufacturer or his representatives will be required to supply such tests for publication, in order that an intelligent opinion of these products may be assured.

Physiologic Standardization.—In cases in which chemical methods of identification are unknown or unreliable, physiologic standardization should be employed. The Council considers the phrase "physiologically standardized" or "assayed" as misleading unless the standard and method are published in sufficient detail to permit of their control by independent investigators.

It is evident that when no standard is published, it is impossible to know whether the quality is high or low, and the conscientious manufacturer who sets for himself a high standard is placed on a level with the dishonest or careless one who adopts a low standard. Again, if the process is not published, it is impossible to learn without actual trial the relative value of one preparation as compared with that of another manufacturer or to confirm or disprove the statements of the manufacturer as to the quality of his product.

Rule 3.—DIRECT ADVERTISING. — *Lay Advertising.* — The impossibility of controlling the irresponsible claims which are usually made in advertisements to the public, the well-known dangers of suggesting by descriptions of symptoms to the minds of the people that they are suffering from the many diseases described, the dangers of an unconscious and innocent formation of a drug habit, and the evils of harmful self-medication, including the dangers of the spread of many infectious and contagious diseases when hidden from the physician, and similar well-known considerations, are the reasons for discouraging, in the interest, and for the safety, of the public, this reprehensible form of exploitation.

Exceptions.—In the case of subjects on which the public should be instructed, as the use of disinfectants and foods, such advertisements, if not in objectionable forms, are considered admissible.

Foods.—We may divide the foods into three groups. The first group contains the ordinary foods, including the well-known breakfast foods. These do not come under the supervision of the Council in any way. The second group includes medicinal foods proper, such as predigested foods, which have a relatively low food value and which are characterized by a high alcohol or preservative content, and which frequently contain strictly medicinal substances, or food substances for which distinct therapeutic properties are claimed. These products should be used only on the advice of the physician,

and the advertisements should be restricted as in the case of ordinary medicines. The third group includes a large and important class of manufactured products, such as invalid and infant foods, which in a sense stand between the first and second groups. The public has the same interest in these foods that the physician has, and usually has full information concerning them. While the primary recommendation of these articles should naturally come from the physician, it cannot be expected that their continued use should depend on repeated prescriptions. Information concerning this group of foods would come naturally and properly from a physician, and the collection and dissemination of this information may very properly be included in the work of this Council. As the use of products in this class is an extended one, it is not proper to limit their advertising to medical journals, but the advertising should be permitted in the lay press so long as it is conducted in a manner compatible with the rules of the Council.

Rule 4.—INDIRECT ADVERTISING.—It should be remembered that the sole intent of this rule is to protect the physician, so that in prescribing a proprietary medicine he need not unconsciously become an advertising agent of proprietors. The rule imposes no restriction on the legitimate methods of bringing a remedy to the attention of the profession, such as advertising in medical journals, circulars and other printed matter distributed solely to physicians. The rule applies only to the package as it may reach the patient.

Naming Diseases on Label.—The naming of diseases on the label or package is not necessary, as is shown by the very large number of proprietary products which have been successfully introduced without resorting to this expedient. This method of popularizing a proprietary remedy with the laity is most objectionable, and should not be tolerated in any form.

Therapeutically Suggestive Names.—The Council considers therapeutically suggestive names (see Rule 8) as an unworthy expedient to the same end. It would prefer to have therapeutic indications omitted from the label and package, but does not insist on this point, because these are useful in some exceptional cases.

Permanently Affixed Names.—It will be considered an infringement of the rule when an article is marketed in bottles which have the name of the article blown into the glass, or if otherwise the name or initials or other distinctive mark of the article are permanently stamped on the container, on the article itself, or are contained on the stoppers or seals. Articles which are marketed in any of these ways are not admitted. Readily removable labels are not objectionable.

Use of Articles for Advertising.—The Council does not countenance the use of an admitted article for advertising other articles which have not been admitted by the Council.

Rule 5.—FRAUDULENT CLAIMS AS TO ORIGIN.—No false or misleading statement in regard to an article can be permitted concerning the source or material from which it is made, or the persons by whom it is made. Some glaring frauds of this nature have been perpetrated in the past, and this rule is intended to prevent such imposition.

Actual Manufacturer.—The identity of the actual manufacturer of an article should be known, since the manufacturer is in part responsible for the quality of the product. No good reason can exist for concealing the identity of the manufacturer of a legitimate article; such concealment must be considered evidence of the doubtful character of a product or its method of exploitation.

Rule 6.—UNWARRANTED CLAIMS AS TO THERAPEUTIC VALUE.—This rule is intended to restrict the direct and indirect claims of the manufacturers or agents as to the therapeutic superiority of their products, to what is compatible with ascertained facts. Manufacturers will be held responsible for all statements referring to their products, made in their advertising literature, whether they occur as original statements or as quotations. The Council aims to be quite liberal in the application of this rule. There are honest differences of opinion as to many therapeutic questions.

Permissible Optimism.—It is natural that a manufacturer should be rather partial toward his own product, and, since every one should be cautious in accepting such biased claims, a moderate degree of emphasis may not be objectionable. The Council, therefore, does not assume to censor any reasonable statements, especially when such statements are confirmed by responsible clinicians.

Exaggerated Claims.—Claims are often made, however, which are incompatible with common experience and which sometimes defy the laws of Nature. Claims which seem highly improbable will not be admitted by the Council unless the manufacturer supports them by evidence acceptable to the Council. In doubtful cases the Council acts on these questions under the advice, and with the cooperation of its staff of clinical consultants.

Rule 7.—POISONOUS SUBSTANCES.—For the information of the pharmacist or dispenser, and to enable him to safeguard the interests of the patient and the physician, all articles containing such potent agents as the poisonous alkaloids and other organic substances and the salts of some of the metals, should have the exact amount of these ingredients which is contained in the average adult dose stated on the label.

Rule 8.—OBJECTIONABLE NAMES.—Many of the abuses connected with proprietary medicines are intimately associated with the more or less arbitrarily selected or "coined," usually protected, names.

Scientific Names.—In the interest of those physicians who would prefer to employ a more rational nomenclature the Council advises the use of scientific names by the manufacturers, at least as synonyms. In view of the existing trade conditions, however, it does not insist on this except in such specific cases as explained below in which experience has shown the necessity of restrictions.

Pharmaceutical Preparations and Mixtures.—Since these, with rare exceptions, are not original in composition, there is no sufficient reason why they should be endowed with arbitrary names; on the contrary, it is important that the prescribing physician should be constantly reminded of the potent ingredients on which the actions of such preparations are based. It is particularly important that actively poisonous or habit-forming drugs be not disguised under an innocently worded title.

Coined Names Where Permitted.—The Council recognizes, on the other hand, the right of discoverers of new synthetic products or active principles to name their discovery, and interposes no objection to arbitrary names for such products, so long as such names do not tend to advertise the product to the laity, as specified under Rule 8. It is desirable, however, that the coined names should indicate the chemical composition of the article. With synthetic chemicals the true chemical name should be stated, at least in addition to the trade name. If an article conflicts only with Rule 8 it may be admitted as soon as the manufacturer substitutes a name which the Council considers satisfactory.

Rule 9.—PATENTS, TRADE-MARKS, COPYRIGHTS, ETC.—This information is desirable in determining the legal status of these articles and will permit their ready recognition in current publications.

Rule 10.—UNSCIENTIFIC AND USELESS ARTICLES.—The Council has been justly criticized because its rules failed to exclude certain unscientific mixtures whether of well-known or obscure substances. The use of articles which are unessential modifications of official or established non-proprietary articles is unscientific and serves no useful purpose. The Council will not admit products which are scientifically unsound and which, therefore, must be considered useless or inimical to the best interest of the medical profession and the public. This class includes mixtures containing an excessive number of ingredients; those which contain substances of no probable therapeutic assistance to each other; those of no therapeutic value. The combination of two or more remedies in a mixture must be considered contrary to scientific medicine unless a distinct reason exists for such combination. This holds especially for ready-prepared mixtures, and these shall be deemed in conflict with Rule 10 unless the manufacturer presents satisfactory evidence for the value of his combination.

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NEW AND NONOFFICIAL REMEDIES

ACETOZONE.—Acetozone is a mixture of equal parts of acetyl-benzoyl peroxide and an inert absorbent powder.

Acetyl-benzoyl peroxide, $C_6H_5CO.O.O.COCH_3 = C_9H_8O_4$, corresponds to hydrogen peroxide, H_2O_2, in which the two hydrogen atoms have been replaced by the radicles of acetic acid (the acetyl group) and of benzoic acid (the benzoyl group).

Acetyl-benzoyl peroxide occurs in white, shining crystals, melting at 36.6° C. (98° F.). When heated it slowly decomposes and volatilizes. Water at 25° C. (77° F.) dissolves one part in 1,560 or 0.639 Gm. in 1,000 Cc. It is soluble in oils to the extent of about three per cent., slightly soluble in alcohol, and fairly so in ether, chloroform, and carbon tetra-chloride, though all solvents slowly decompose it with the exception of neutral petroleum oils.

In the presence of water it undergoes hydrolysis and slowly decomposes. This change, however, does not take place with sufficient rapidity to prevent its use in aqueous solution; in fact such hydrolysis is necessary to develop its full germicidal activity. On account of its ready decomposition, acetozone should be kept in a dry place.

For various reasons it has been found necessary to add an inert absorbent powder. As found in the market, acetozone is of a grayish white color, possessing the properties of the crystalline substance, with the exception that the absorbent powder employed is insoluble.

Actions and Uses.—Acetylbenzoyl peroxide belongs to a class of compounds known as the organic peroxides in which an excess of oxygen has been combined in such a way that it is somewhat slowly given off in a nascent condition. On contact with water it hydrolyzes, forming benzo-peracid and aceto-peracid, which exert marked oxidizing and germicidal action. In consequence of this change, these compounds are thought to be particularly adapted for internal administration.

It is said to be useful as an antiseptic in ophthalmic, aural and nasal practice, and to give good results by acting as an intestinal antiseptic when given internally, especially in typhoid fever.

Dosage.—Acetozone is generally employed in aqueous solution prepared as follows: Add acetozone to warm water in the proportion of 1 Gm. to 1,000 Cc. (15 grains to the quart), shake vigorously for five minutes, and allow to stand for about two hours. Decant the liquor as required. This solution may be drunk *ad libitum*, two quarts or more being taken by an adult in twenty-four hours. Acetozone is also used in oily solution as an inhalant.

Manufactured by Parke, Davis & Co., Detroit, Mich. U. S. patents No. 710,005 (Sept. 30, 1902; expires 1919) and No. 717,016 (Dec. 30, 1902; expires 1919). U. S. trademark.

Acetozone Inhalant.—Each 100 Gm. contain acetozone 1.0 Gm.; chloretone (chlorbutanol), 0.5 Gm.; refined liquid petroleum, 98.5 Gm.

ACETPHENETIDIN

ACETPHENETIDIN.—Acetphenetidin is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physician's Manual of the Pharmacopeia and the National Formulary.

Actions and Uses.—This is one of a large group of derivatives or chemical relatives of aniline (amino-benzene). The members of this group have similar properties and are more or less active according as they undergo decomposition in the system so as to yield either para-amino-phenol or acetyl-amino-phenol. They have a more or less pronounced action on the blood by which they produce hemolysis and destruction of the red blood corpuscles. They also act as heart depressants.

Acetphenetidin and its congeners are antipyretics and analgesics. They are extensively employed for the relief of pain. For this purpose they should be used with caution in consideration of their poisonous properties.

They have also been considerably employed for the reduction of temperature in fever. Every newly discovered product related to acet-phenetidin has been heralded as a "safe" antipyretic and free from poisonous effects on the blood and heart. Invariably extended clinical experience has shown that all these preparations are to a greater or less degree hemolytic and depressing to the circulation. Hence their employment in the infectious fevers should be most cautious.

PHENACETIN.—Phenacetin is a name applied to Acetphenetidinum, U. S. P.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co. Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 400,086 (expired); U. S. trademark Nos. 16,392 and 18,637.

AGAR-AGAR.—Agar-agar (Agar-agar, Pharm. Française, 1908) is a substance extracted in the East Indies from various sea weeds.

This substance seems to come principally from Eucheuma gelatinum, E. spinosum (Linné) J. Agardh., Gelidium corneum (Hudson) Lam., G. cartilagineum Gaill., Gloiopeltis tenax (Turner) J. Agardh.

Agar-agar is extracted by hot water and dried for commercial purposes in the form of bundles of shreds, or powder form. It is odorless and insipid, insoluble in cold water but soluble in hot water. A solution containing 1.5 per cent. gives quite a stiff jelly on cooling.

Agar-agar consists practically of gelose, which dissolves in 500 parts of water and is precipitated in an impure form by alcohol. Gelose is a carbohydrate which is converted into galactose on boiling with dilute sulphuric acid. On drying at 100° C. agar-agar loses about 20 per cent. of water. 100 parts of dry substance furnish about 4 parts of ash, which, when treated with hydrochloric acid and examined with the microscope, shows the presence of diatoms, the most characteristic of which are Arachnoidiscus—Ehrenbergii Baill. and several Grammatophora and Cocconeis. An aqueous solution of agar-agar gives no precipitate with solution of tannic acid (absence of gelatin), and no blue color with solution of Iodin (absence of starch).

Actions and Uses.—Agar-agar absorbs water in the stomach and intestines and forms a jelly, which being indigestible increases the bulk of the feces.

It is employed as a demulcent and for the treatment of constipation.

Dosage.—From 5 to 15 Gm. (75 to 240 grains). Agar-agar is administered in substance, coarsely comminuted and mixed with food.

AGARIC ACID.—Acidum Agaricum.—Acidum Agaricinicum (Pharm. Helvetica, edit. 4.) **Agaricinum**[1] (Pharm. Danica, edit. 1907). A tribasic acid $C_{19}H_{34}OH(COOH)_3 + 1\frac{1}{2}H_2O$, derived from Polyporus officinalis, Fries (Order Hymenomycetes; fam. Polyporeæ) a fungus growing on the European Larch and other species of larch.

Agaric acid occurs as an odorless, tasteless, glistening microcrystalline powder, which melts at 141.5-142° C. (286.5-287.5° F.). When heated to a high temperature it is volatilized in the form of a white pungent vapor.

Agaric acid is slightly soluble in cold water; when heated with 50-100 parts of water, it becomes gelatinous and finally dissolves to a weakly acid solution, which possesses the characteristic property of foaming strongly when shaken. The addition of acids to hot aqueous solutions of agaric acid causes white flocculent precipitate, but a tannic acid solution (1:100) produces neither coloration nor turbidity. With alkalies agaric acid forms water soluble salts.

Agaric acid is slightly soluble in ether, chloroform, carbon-disulphide and in 130 parts 90 per cent. alcohol. It is soluble in hot acetic acid, acetic ether, oil of turpentine and in about 10 parts of alcohol.

If to a mixture of about 0.2 Gm. of agaric acid with 3 Cc. of water 2 drops of alcoholic alpha-naphthol solution (1:8) are added and then gradually 5 Cc. of concentrated sulphuric acid added the mixture should not take on a marked blue-violet color.

If 0.10 Gm. agaric acid be boiled with 10 Cc. dilute sulphuric acid a turbid solution results, from which on standing on a water bath, oily drops separate, and they crystallize on cooling.

0.1 Gm. agaric acid upon ignition should leave no weighable residue.

Action and Uses.—Agaric acid is a local irritant and in large doses produces vomiting and purging, and death through central paralysis. It paralyzes the peripheral nerves of the sweat glands, arresting the secretion of sweat. It is used to arrest colliquative sweats. The experience of most clinicians is favorable, but some report that they were unable to obtain

1. The substance commonly sold as agaricin is an impure alcoholic extract

any favorable effects. The action appears in a few hours and is not lasting. Agaric acid is one-twentieth as active as atropine and does not influence other secretions.

Dosage.—The maximal single dose of agaric acid should not exceed 0.03 Gm. (½ grain) and the total daily dose should not exceed 0.10 Gm. (1½ grains) (Pharm. Helv.). Owing to its irritant action it cannot be given hypodermically.

ALBARGIN.—Gelatosesilver.—Albargin is a compound of silver nitrate with gelatose, containing from 13 to 15 per cent. of silver.

It is prepared by adding silver nitrate to a solution of gelatose in water, evaporating the solution or precipitating the compound by the addition of ether or alcohol. It is a coarse, yellow, shining powder, very easily soluble in water, forming neutral solutions. The presence of gelatose, silver and a nitrate can be shown by appropriate tests. It is incompatible with tannin and chlorides.

Actions, Uses and Dosage.—Albargin is used as a substitute for silver nitrate.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York).

Albargin Tablets. Each tablet contains albargin 0.2 gm. (3 grains).

ALPHOZONE.—Succinic Dioxide.—Succinic Peroxide, Disuccinyl Peroxide.—Alphozone, $(COOH.CH_2.CH_2.CO)_2O_2 = C_8H_{10}O_6$, is succinylic acid peroxide, corresponding to hydrogen peroxide, H_2O_2, in which the hydrogen has been replaced by two succinic acid groups; each succinic acid radicle still retaining one of its acid-hydrogen atoms.

It is prepared by the interaction of a strong solution of hydrogen dioxide with succinic anhydride, resulting first in the formation of succinic peracid, $COOH.CH_2.CH_2.COOOH$, which reacts with one molecule of succinic anhydride to form succinic peroxide.

It is a fluffy, white, crystalline powder, the crystals being small irregular plates. It dissolves in 30 parts of water at ordinary temperature. It is moderately soluble in alcohol, acetone, and ethyl acetate, sparingly soluble in ether, insoluble in benzene, chloroform and ligroin. Odorless or nearly so; softens at 115° C. (239° F.) and melts at 127° C. (262° F.) with decomposition. When brought into a flame it explodes, but it does not explode on percussion or friction. It deteriorates slightly on continued exposure to air, but if kept tightly stoppered and in a dark place it remains unchanged indefinitely.

It is a powerful oxidizing agent, liberating iodine from potassium iodide. It can be identified by its physical properties and its powerful oxidizing action. To test its strength add 2 Gm. of potassium iodide to 1 Gm. of alphozone dissolved in 60 Cc. of distilled water. To this slowly add decinormal solution of sodium thiosulphate with constant agitation until the red brown color of the iodine is just discharged. Each cubic centimeter of sodium thiosulphate solution is equivalent to 0.0117 Gm. of alphozone; 1 Gm. of pure alphozone is equivalent to 85.41 Cc. decinormal sodium thiosulphate solution.

Actions and Uses.—Alphozone belongs to the class of organic peroxides, and by virtue of its oxidizing power is germicide and antiseptic. Alphozone also possesses deodorant and bleaching properties. The fact that it does not effervesce with pus nor in contact with the living tissues is claimed as an advantage over hydrogen dioxide.

Alphozone is employed both externally and internally. It is said to be useful for disinfecting the hands and such instruments as are not attacked by oxidizing agents. It is used for the disinfection of the field of operation and has been employed for its germicidal effect with asserted good results in local infections in which the substance can be brought in contact with the diseased surface, such as ulcers, abscesses, inflammation of mucous membranes, and infectious skin diseases. Internally it has been used in typhoid fever and as an intestinal antiseptic.

Dosage.—Alphozone is employed in solutions containing 1 part per 1,000 for general external use. As a nasal douche a proportion of 1 to 3,000 is often preferred.

Manufactured by F. Stearns & Co., Detroit, Mich. U. S. patents Nos. 708,561 and 768,563 (Aug. 23, 1904; expires 1921). U. S. trademark No. 41,981.

Alphozone Tablets, 1 grain. Each tablet contains alphozone 0.065 gm. (1 grain). One tablet to 60 Cc. (2 fluidounces) of water gives a solution of 1 to 1,000.

ALUMNOL—Alumini Naphtholsulphonas.—Aluminum Betanaphthol - Disulphonate. — Alumnol, $Al_2(C_{10}H_6.OH.(SO_3)_2)_3 = Al_2C_{30}H_{18}O_{21}S_6$, is aluminum betanaphthol-disulphonate, the aluminum salt of betanaphthol-disulphonic acid.

It is prepared by mixing solutions of barium naphthol-disulphonate and aluminum sulphate in molecular proportions, filtering off the barium sulphate, and evaporating the filtrate to dryness.

It forms a fine, nearly white, non-hygroscopic powder, soluble in 1.5 parts of water, forming a faintly acid and slightly fluorescent solution.

It is also easily soluble in glycerin, but sparingly soluble in alcohol and insoluble in ether. When dried it loses about 9 per cent. of water, and when exposed to the air it is darkened in consequence of its reducing properties. It is precipitated from solution by albuminous and gelatinous bodies, but these precipitates are redissolved in excess of the latter bodies.

The aqueous solution (1-10) should be clear, and after acidulation with hydrochloric acid should become at most only slightly turbid, and only just tinted bluish by potassium ferrocyanide; nor should precipitates be produced in it on the addition of diluted sulphuric acid or solution of ammonium oxalate. The dried compound should yield 12.7 per cent. of ash (alumina) on incineration.

It should not be exposed to the air, and is incompatible with salts of silver, or other reducible salts.

Actions and Uses.—It is an astringent and mild antiseptic It is claimed that it can be used as a mild astringent, an irritant or a caustic, according to the strength of the solution, and it is asserted that it exerts a peculiarly destructive action on gonococci. It has been recommended for a variety of affections in which a caustic, astringent or antiseptic is indicated. It has been particularly recommended for gonorrhea in females, especially when affecting the endometrium.

Dosage.—As a surgical antiseptic, in 0.5 to 3 per cent. solutions; in gynecology, in 2 to 5 per cent. solutions; in otology and laryngology, either as a powder or in ¼ to 1 per cent. solution as douches, washes or gargles; as cautery, in 10 to 20 per cent. solution.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). German patent No. 74,209.

ALYPIN.—Alypin is 2-benzoxy-2-dimethyl-amino-methyl-1-dimethyl-amino-butane hydrochloride, $CH_3.CH_2.C(C_6H_5COO)(CH_2N(CH_3)_2).CH_2N(CH_3)_2.HCl = C_{18}H_{28}O_2N_2.HCl$. It is closely related to Stovaine (which see).

By the action of dichloracetone, $CH_2Cl.CO.CH_2Cl$, on ethyl-magnesium bromide dissolved in ether and decomposition by water of the magnesium compound formed, ethyl-dichlorhydrin, $CH_2Cl.C(C_2H_5)(OH).CH_2Cl$, is obtained. From this, by the action of dimethylamine, ethyl-tetramethyl-diamino-propanol is produced. This product is treated with benzoyl chloride and the benzoyl-ethyl-tetramethyl-diamino-propanol neutralized with hydrochloric acid to form the chloride.

Alypin is a white, crystalline powder, melting at 169° C. (336.2° F.), hygroscopic and extremely soluble in water. Its solutions are neutral and are not rendered turbid on addition of sodium bicarbonate in moderate quantities, and may be sterilized by boiling for a period not exceeding five minutes, without decomposition. It is easily soluble in alcohol. It has a markedly bitter taste.

It should be protected from the air in well-stoppered containers. Two and four per cent. solutions are quite stable, but weaker solutions are likely to become mouldy.

Addition of potassium iodide test solution to the aqueous solution (1-100) produces a white precipitate; potassium dichromate test solution produces a yellow crystalline precipitate soluble in hydrochloric acid; potassium permanganate test solution produces a violet crystalline precipitate, which turns brown on standing. If 0.1 Gm. Alypin be mixed with 1 Cc. sulphuric acid and warmed to 100° C. (212° F.) for five minutes and then 2 Cc. water carefully added, the odor of benzoic-ethyl-ester is developed; on cooling crystals separate out, which are dissolved on adding 2 Cc. alcohol. If Alypin is dried at 100° C. (212° F.) the loss should not exceed 1.5 per cent.

Actions and Uses.—It is a local anesthetic, claimed to be equal to cocaine, but not a mydriatic; it is said not to produce disturbance of accommodation and to be less toxic than cocaine.

Dosage.—Externally in the form of a 10 per cent. solution hypodermically in 1 to 4 per cent. solutions; for the eye in 1 to 2 per cent. solutions. As much as 5 Cc. of a 3 per cent. solution was well tolerated in one case.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 808,748 (Jan. 2, 1906; expires 1923). U. S. trademark No. 44,608

Alypin Tablets, 3 1/3 grains. Each tablet contains 0.22 Gm. (3⅓ grains) of alypin.

Alypin Tablets, 1 1/8 grains. Each tablet contains 0.073 Gm. (1⅛ grains) of alypin.

Alypin Tablets, 3/4 grain. Each tablet contains 0.048 Gm. (¾ grain) of alypin.

Alypin Tablets, 1/3 grain. Each tablet contains 0.022 Gm. (⅓ grain) of alypin.

AMMONIUM HYPOPHOSPHITE—Ammonii Hypophosphis.—Ammonium hypophosphite, $NH_4H_2PO_2$, is the ammonium salt of hypophosphorous acid.

Ammonium hypophosphite may be prepared by double decomposition between aqueous solutions of barium hypophosphite and

ammonium sulphate. The liquid filtered from the precipitate is evaporated to dryness and the ammonium hypophosphite extracted from the residue with hot alcohol.

Ammonium hypophosphite occurs in irregular hexagonal plates which melt without decomposition and at a higher temperature give off water and spontaneously inflammable hydrogen phosbide. According to H. Rose, ammonia, NH_3 escapes first. The compound is less soluble in water than the potassium salt, but is very soluble in absolute alcohol.

The aqueous solution should be neutral or slightly acid to litmus paper, and on gently heating with potassium hydroxide test solution evolves ammonia. The diluted aqueous solution slightly acidulated with dilated sulphuric acid, yields, with silver nitrate test solution, a brown precipitate, which rapidly turns black, owing to the separation of metallic silver. With copper sulphate test solution, after addition of dilute acid and on gentle heating, a reddish brown precipitate is formed. When the aqueous solution of the salt (1 in 20), acidulated with hydrochloric acid, is added, drop by drop, to an excess of mercuric chloride test solution, a white precipitate of mercurious chloride is formed. On further addition of the hypophosphite solution in excess, the precipitate becomes gray from reduction to metallic mercury.

The solution in water should give not more than a faint turbidity on the addition of barium chloride test solution nor on the addition of diluted sulphuric acid. A solution of 1 Gm. ammonium hypophosphite in 10 Cc. water should not be alkaline toward phenolphthalein test solution; to render this solution alkaline should not require more than 0.4 Cc. normal potassium hydroxide. The aqueous solution of the salt (1 in 20), acidulated with hydrochloric acid, should not respond to the U. S. P. Time-limit Test for heavy metals. If 5 Cc. of the aqueous solution of the salt (1 in 10) be measured into a beaker containing 3 Cc. of nitric acid, diluted with about 10 Cc. of water and evaporated to dryness on a water bath, the residue should not respond to the U. S. P. Modified Gutzeit's Test for arsenic.

Action and Uses.—Ammonium hypophosphite exhibits the actions of its constituents. There are differences of opinion as to whether these constituents have action other than that on the digestive tract. It is used as a stimulating expectorant and "alterative," in diseases of the respiratory mucosæ, particularly in the later stages of acute bronchitis and laryngitis, and in chronic catarrhal conditions.

Dosage.—0.13 Gm. (2 grains) every 2 or 3 hours.

Proprietary Preparation:

GARDNER'S SYRUP OF CHEMICALLY PURE HYPOPHOSPHITE OF AMMONIUM.—Syrupus Ammonii Hypophosphitis (Gardner).—A syrup containing 3.33 Gm. ammonium hypophosphite in each 100 Cc. (16 grains in each fluidounce).

Action, Uses and Dosage.—See ammonium hypophosphite.

Manufactured by R. W. Gardner, New York City.

AMYL VALERATE — Amylis valeras. — Amyl valerate, $CH_3.CH(CH_3).CH_2.COO(CH_2.CH(CH_3).CH_2.CH_3) = C_{10}H_{20}O_2$, is the iso-valeric acid ester of iso-amyl alcohol.

Amyl valerate is obtained by separating (by distillation) the ester which is formed when valeric acid or solution of a valerate is added to a mixture of iso-amyl alcohol and sulphuric acid and the distillate obtained, washed, dried and redistilled.

Amyl valerate is a colorless liquid, having when dilute an odor of apples. It is insoluble in water, soluble in alcohol, ether and chloroform. It boils at 188-190° C. (370.4-374° F.). Its specific gravity is .858 at 15° C.

Action and Uses.—Amyl valerate has been employed in the treatment of gallstone colic. Its employment in renal colic is not satisfactory.

Dosage.—To relieve biliary colic, 0.2 to 0.04 Cc. (3 to 6 minims) in capsules every half hour; or 1 Cc. (15 minims) in capsules, three times daily.

ANTHRASOL—Colorless Coal Tar.—Anthrasol is coal tar, freed from pitch, pyridin bases and coloring matter, and mixed with juniper tar.

Coal tar is freed from bases, such as pyridin and chinolin by treatment with acids and from pitch by distillation. The distillate, containing the hydrocarbons and phenols of tar is purified to remove constituents causing discoloration. To prevent separation of solid constituents juniper tar is added, and oil of peppermint to correct the odor. It is a thin, mobile, light-yellow oil which does not stain either skin or linen.

Actions and Uses.—Antrasol is antiseptic, parasiticide, keratoplastic, anti-pruriginous; like ordinary tar, it allays irritation of the skin, but is claimed not to obstruct the follicles nor to favor the development of acne.

It is said to be useful in chronic or subacute skin diseases, various forms of eczema, especially for after-treatment, and for all pruriginous affections; in diseases of the hair, as a restorative and for the removal of dandruff.

Dosage.—Locally in the form of a 5 to 10 per cent. petrolatum ointment in eczema; 10 per cent. ointment with glyceryte of starch and 10 per cent. of wool fat (adeps lanæ) in pruritus; 20 to 30 per cent. ointment or paste, in lichen; in combination with sulphur and soft soap, in parasitic *skin affections.*

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. U. S. trademark No. 40,634.

ANTIFORMIN. Antiformin is a strongly alkaline solution of sodium hypochlorite. In each 100 c.c. it contains approximately sodium hypochlorite equivalent to 5.68 gm. available chlorine, sodium hydroxide 7.8 gm., and sodium carbonate 0.32 gm.

According to the patent specification chlorinated lime is dissolved in water at the temperature of 35° C. To this a solution of sodium carbonate is added. After standing the supernatant liquid is decanted and to this sodium hydroxide is added.

Antiformin is a yellowish, clear liquid having the peculiar odor characteristic of hypochlorites.

The per cent. of available chlorine, of alkali hydroxide and carbonate may be determined by the methods described in the Reports of the Chemical Laboratory of the American Medical Association, 1911.

Actions and Uses.—Antiformin rapidly dissolves the bodies of bacteria with the exception of acid-fast organisms like the tubercle bacillus, on which it has no solvent action and which resists its germicidal action to a great extent. It dissolves other organic matters, such as those contained in sputum and feces. It exerts a strong oxidizing action and is disinfectant, antiseptic and deodorizing. It is said to be more than three times as active in germicidal action as phenol.

Based upon its property of dissolving most bacteria and the insoluble constituents of the sputum, Antiformin is employed in testing for tubercle bacilli. It is said to be useful for the sterilization of the surgeon's hands, of instruments and of wounds and for general purposes of disinfection. It is also said to be useful in certain skin diseases.

Dosage.—Externally in from 2 to 10 per cent. solution. In from 4 to 1,000 solution as a spray. As a disinfectant 5 per cent. solutions are used. For the demonstration of tubercle bacilli 15 per cent. solutions are suitable.

Manufactured by the American Antiformin Co., New York. U. S. patent No. 691,671 (Jan. 21, 1902; expires 1919). A process for Cleaning Beer Vats and Pipes, said process consisting according to the patent specifications "in subjecting the walls of said vats or pipes to the action of a solution composed of about 1 part of alkaline hypochlorite with about a half to one part of alkaline hydrate, substantially as specified." U. S. trademark No. 61,693.

ANTIPYRINE SALTS

Antipyrine, phenyldimethylpyrazolon, is a weak base which unites with acids to form unstable salts that hydrolyze readily when dissolved in water separating into their components. The therapeutic activity of these compounds represents a combination of the actions of the acid and the base.

ANTIPYRINE SALICYLATE—Antipyrinæ Salicylas.—Antipyrine salicylate, $C_{11}H_{12}N_2O.C_6H_4OH.COOH = C_{18}H_{18}N_2O_4$, is a weak chemical combination of antipyrine and salicylic acid.

It is prepared by heating antipyrine and salicylic acid, in molecular proportions, on the water bath, allowing the oily product to congeal by cooling, and crystallizing it from alcohol.

It occurs as a white, coarsely, crystalline powder, or in hexagonal tabular crystals, melting at 91° to 92° C. (195.8° to 197.6° F.); odorless, slightly sweet; soluble in 200 parts of cold and 40 parts of boiling water; readily soluble in alcohol, less readily in ether. It is decomposed by acids with the elimination of salicylic acid, and by alkalies with the elimination of antipyrine.

Its aqueous solution is rendered milky by tannic acid, then colored green by the addition of a few drops of fuming nitric acid. It is colored deep red by ferric chloride, passing to violet-red on copious dilution with water. It must not be affected by hydrogen sulphide.

It is incompatible with acids, alkalies and tannins.

If 1 Gm. antipyrine salicylate is weighed in a separator, treated with 25 Cc. water and 10 Cc. sodium hydroxide test solution, and the liquid then extracted with chloroform, the latter on evaporation should yield a residue which when dry should weigh 0.57-0.58 Gm., melt at 113 degrees and respond to the tests for antipyrine.

The solution remaining in the separator, acidified, and extracted with chloroform, the chloroform allowed to evaporate, should yield a residue of white needle-like crystals, which when dry melt at 153°-156° and respond to the tests for salicylic acid.

If 1 Gm. antipyrine salicylate is dissolved in 50 Cc. diluted alcohol, a few drops of phenolphthalein added, from 30.5-30.8 Cc. tenth normal alkali should be required to produce a permanent pink color, indicating a salicylic acid content of 42.10-42.50 per cent.

Actions and Uses.—This compound possesses the properties of both antipyrine and salicylic acid and combines the analgesic power of the one with the antirheumatic action of the other. It has been used with good results in sciatica, rheumatic fevers, chronic rheumatism influenza, pleurisy, dysmenorrhea, etc.

Dosage.—0.3 to 2.0 Gm. (5 to 30 grains) in cachets or capsules.

Non-proprietary preparations:

Antipyrine Salicylate, Farbwerke. Manufactured by Farbwerke vorm. Meister Lucius & Bruening, Hoechst a. M., Germany. (Victor Koechl & Co.) Not patented or trademarked.

Proprietary Preparation:

SALIPYRIN.—A name applied to antipyrine salicylate.

Manufactured by J. D. Riedel Aktiengesellschaft, Berlin, Germany. (Riedel & Co., New York.) U. S. patent No. 444,004 (expired). U. S. trademark No. 19,043.

TUSSOL—Antipyrinæ Mandelas—Antipyrine Mandelate.—Tussol is antipyrine mandelate, $C_{11}H_{12}N_2O.C_6H_5CHOH.COOH = C_{19}H_{20}O_4N_2$, a salt of mandelic acid, $C_6H_5(CHOH.COOH)$, and antipyrine.

It is prepared by heating mandelic acid and antipyrine in molecular proportions on a steam bath, and crystallizing the product of the reaction, after cooling from alcohol.

It is a white crystalline powder, having a bitter taste and melting at 52° to 53° C. (125.6° to 127.4° F.). It is soluble in 15 parts of water, 3 to 4 parts of alcohol, or 25 to 26 parts of ether, producing solutions of acid reaction. When heated above the melting point, it gives off the odor of bitter almonds, and finally burns without leaving a residue. It is split into its constituents by milk and by alkalies.

Its aqueous solutions give the reactions for antipyrine; if warmed with potassium permanganate it develops the odor of benzaldehyde, but it is not affected by silver nitrate, barium nitrate, dilute sulphuric acid, or hydrogen sulphide.

It is incompatible with alkalies, milk and milk food.

Actions and Uses.—Tussol, Antipyrine Mandelate, has the properties of its constituents, that is, the analgesic and sedative action of antipyrine and the stimulant action on glandular secretions of mandelic acid. It is said to be useful in the treatment of whooping-cough.

Dosage.—0.3, 0.1, 0.25, 0.4 or 0.5 Gm. (½, 2, 4, 6 or 8 grains), according to the age of the patient.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 569,415 (Oct. 13, 1896; expires 1913).

ANTIPYRINE FERRIC CHLORIDE

FERRIPYRINE.—A name applied to a product identical with Ferropyrine, which see.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York).

FERROPYRINE — Antipyrina Cum Ferro.— Ferropyrine, $(C_{11}H_{12}N_2O)_3.(FeCl_3)_2$, is a compound of antipyrine and ferric chloride, containing about 36 per cent. of ferric chloride and 64 per cent. of antipyrine.

It is prepared by mixing solutions of 5 parts of crystallized ferric chloride in 10 parts of 96 per cent. alcohol and 5 parts of antipyrine in 10 parts of alcohol and 50 parts of ether, washing the precipitate with ether, and drying it on porous tiles at 40° C. (104° F.).

It is a yellowish-red, crystalline powder, having an acid-astringent taste. It is soluble in 5 parts of cold water, but requires 9 parts of hot water for solution; it is soluble in alcohol, but insoluble in ether.

It should form a clear blood-red solution in water. Its aqueous solution 1:5 affords a precipitate of ferric hydroxide on addition of ammonia in excess, and the filtrate should give no reaction for nitric or sulphuric acid, nor heavy metals, and should yield a residue on evaporation, which is completely volatilized when heated on platinum. After acidification with nitric acid, the filtrate yields a white precipitate with silver nitrate and in the filtrate from this the antipyrine may be determined by means of ferric chloride or by nitrous acid.

It is incompatible with alkalies, their carbonates and bicarbonates.

Actions and Uses.—It is hematinic, hemostatic, astringent, analgesic and tonic. Its styptic action is pronounced and said not to be accompanied by irritant effects. According to Fraenkel it combines, with its hemostatic properties, the injurious by-actions which limit the application of ferric chloride as a hemostatic.

Dosage.—0.3 to 1 Gm. (5 to 15 grains) in powder, or in solution. Externally 1 to 1.5 per cent. solution as an injection, to 20 per cent. solution or pure for hemorrhages.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. U. S. patent No. 548,352 (Oct. 22, 1895; expires 1912). U. S. trademark No. 26,860.

ANTITHYROID PREPARATIONS

Preparations obtained from the blood or milk of animals, after the removal of the thyroid glands.

The use of these preparations is based on the theory that the thyroid gland secretes products which are toxic, but which neutralize, and are neutralized by, other toxic substances produced elsewhere in the body. Removal of the thyroid glands would then lead to the accumulation of these second toxic substances as evidenced by the phenomena of cachexia strumipriva and myxedema. On the other hand, the blood or milk of such animals is claimed to be capable of preventing the effects of a hypersecretion of thyroid substance, such as is supposed to occur in Basedow's disease (exophthalmic goiter).

These views are still largely hypothetical; but some clinical observers report distinctly beneficial results in the milder forms of the disease and in obscure nervous disorders which are supposedly connected with thyroid hypersecretion. The effects, if they occur at all, are less pronounced in the more severe forms. The action is merely palliative and other measures of treatment should not be neglected.

Improvement is said to occur in two or three weeks and to be indicated by an amelioration of the nervous symptoms, tremors, palpitation, insomnia and excitability.

The administration must be long continued. Oral and hypodermic administration are said to be equally effective but the former is usually preferred. These preparations are not known to be toxic, even when very large doses are used.

ANTITHYROIDIN-Mœbius—Serum Antithyroideum, Merck.—Antithyroidin-Mœbius is the blood-serum of sheep from which the thyroid gland has been removed at least six weeks before the blood is drawn, preserved by the addition of 0.5 per cent. of phenol.

It is an amber-colored fluid, with faint odor and taste of phenol (carbolic acid). It is marketed in amber-colored vials containing 10 Cc. (2½ drams). With proper precautions, it is said to keep indefinitely.

Dosage.—It is administered by the mouth in doses beginning with 0.5 to 1 Cc. (8 to 15 min.) three times a day, gradually increasing the dose as necessary.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

THYREOIDECTIN—Capsulæ Antithyroideæ.—Thyreoidectin consists of gelatin capsules each containing 0.33 Gm. (5 grains) of a powder prepared from the blood of thyreoidectomized animals.

The blood is derived from sheep, goats or horses (chiefly sheep) from which the thyroid gland has been removed. The blood is rendered aseptic during the process of desiccation by the addition of chloroform, and aromatics are added to the resultant powder as a flavor.

The contents of the capsules consist of a coarse, reddish-brown powder, resembling dried blood.

Dosage.—One or two capsules three times a day, the amount being varied to suit the individual case.

Prepared by Parke, Davis & Co., Detroit, Mich.

APINOL—Apinolum.—Apinol is a product obtained in the destructive distillation of the wood of Pinus palustris and Pinus australis. It is claimed to consist mainly of laevomenthone, $C_{10}H_{18}O$.

Apinol is obtained from the products of destructive distillation of pine wood. After the removal of turpentine and other low boiling constituents by distillation, the portion boiling between 182.2°-193.3° C. (360°-380° F.) is collected and purified.

It is a clear amber-colored oil with an odor resembling that of the pine, having a specific gravity of 0.946 and an approximate boiling point of 182.2° C. (360° F.). It is neutral in reaction.

Actions and Uses.—Apinol is said to be an antiseptic, local anesthetic and expectorant.

It is said to be useful when applied externally to wounds, burns, ulcers, and denuded surfaces for the relief of pain and promotion of healing.

It is claimed to be of service when given internally in catarrhal inflammation of the digestive tract and, when used by inhalation, to assist in freeing the respiratory passages from accumulated mucus.

Dosage.—Internally from 0.3 to 1 Cc. (5 to 15 minims) with cane sugar as a menstruum.

Manufactured by the Apinol Chemical Co., Wilmington, N. C. U. S. trademark No. 29,848.

APIOL—Apiolum Crystallisatum.—Parsley Camphor.—Apiol, $CH_2{:}CH.CH_2.C_6H(OCH_3)_2{:}O_2{:}CH_2 = C_{12}H_{14}O_4$, is 2,5-dimethoxy-3,4-methendioxy-1¹propenylbenzene, derived from 2,3,4,5-tetrahydroxy-1-propen (1²)yl-benzene, $C_6H(OH)_4(CH_2CH{:}CH_2)$.

Apiol may be obtained by extracting the oleoresin (oleoresin of parsley seed, which see) with ether and subsequent purification. It may also be obtained by submitting parsley seed to steam distillation, cooling the volatile oil and collecting and purifying the crystals which separate.

Apiol crystallizes in long needles, having a faint odor of parsley, melting at 30° C. (86° F.) and boiling at 294° C. (561.2° F.). It is insoluble in water, but readily soluble in alcohol and ether. With strong sulphuric acid it forms a blood-red solution. Apiol is not affected by aqueous solutions of potassium or sodium hydroxide, but by alcoholic solution of potassium or sodium hydroxide it is gradually converted to isoapiol, which melts at 56° C. (132.8° F.).

Actions and Uses.—Apiol is said to produce cerebral excitation similar to that induced by coffee and in larger doses a species of intoxication, with vertigo, ringing in the ears and severe frontal headache.

Apiol has been used as an antiperiodic, but is regarded as of inferior rank for this purpose. It has also been recommended in the treatment of amenorrhea.

Dosage.—0.13 to 0.3 Gm. (2 to 5 grains) in capsules, as an emmenagogue, 0.3 to 1 Gm. (4 to 15 grains) as an antipyretic.

ARBUTIN.—Arbutinum.—Arbutin, $C_{12}H_{16}O_7 + \frac{1}{2}H_2O$, is a glucosid occurring in the leaves of *Arctostaphylos Uva-ursi* Spr., *Vaccinium Vitis-Idaea L.* and many other genera of the family *Ericaceae*.

Arbutin occurs in long, glistening, colorless needles, or as a fine, white, crystalline, odorless powder having a bitter taste. It is soluble in 8 parts of water and 16 parts of alcohol; very soluble in hot water and hot alcohol; insoluble in chloroform, ether and carbon disulphide. Its aqueous solution is neutral to litmus paper and is not precipitated by solutions of the metallic salts or by solution of tannin. Its aqueous solution is colored blue by ferric chloride test solution. By boiling with diluted sulphuric acid or by treatment with emulsin arbutin is converted into glucose and hydroquinone.

When heated to 100° C. (212° F.) arbutin loses its water of hydration. At 144° to 146° C. (291.2° to 294.8° F.) the anhydrous glucosid melts. It should leave no residue on ignition.

An aqueous solution of arbutin (1/20) should not be affected by hydrogen sulphide (absence of lead)

Actions and Uses.—Arbutin probably owes its effect, at least in part, to the antiseptic action of hydroquinone, formed by its decomposition in the urinary tract. It has been used as a urinary antiseptic and diuretic.

Dosage.—0.2 to 0.5 Gm. (2 to 7 grains) three or four times a day.

ARGENTAMIN — Liquor Argentamini.— Ethylene-Diamine-Silver Nitrate.—Argentamin is an aqueous solution of silver nitrate and ethylene-diamine, corresponding to 10 per cent. of silver nitrate.

It is prepared by dissolving 10 parts each of silver nitrate and ethylene-diamine in 100 parts of water. It is a colorless, alkaline liquid, turning yellow on exposure to the light, but not precipitable by chlorides or by albumin. It is not materially injured by exposure to light, as it may be cleared by filtration.

Actions and Uses.—Argentamin is antiseptic and astringent like other silver salts, with the asserted advantage of being non-irritant and more penetrating than silver nitrate. It is said to be useful in all cases where the non-caustic action of silver nitrate is indicated.

Dosage.—It may be used in the anterior urethra in 0.25 to 1 per cent. solution; in the posterior urethra in from 1 to 4 per cent. solution; in ophthalmology in 5 per cent. solution.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). German patent No. 74,634.

ARGONIN—Caseinsilver—Silvercasein.—Argonin is a compound of silver and casein containing 4.28 per cent. of silver.

It is prepared by precipitating an alkaline solution of casein with silver nitrate and alcohol. It is a fine, nearly white powder, easily soluble in water, forming an opalescent, faintly alkaline solution, which becomes clear on the addition of sodium chloride. It is also soluble in alkaline solutions, in egg albumin, blood serum, etc.

The usual reagents for silver do not affect its aqueous solution (1-20), which should remain clear on addition of sodium chloride, and should not be affected by hydrogen sulphide. On incineration, argonin should yield at least 4 per cent. of silver, which may be identified by the usual tests after solution in dilute nitric acid. It is incompatible with acids.

Actions and Uses.—Its action and uses are similar to those of silver nitrate, but it is claimed to have greater power of permeating living colloid membranes than other silver albumoses.

Dosage.—It is generally used in 0.5 per cent. solution, but even 20 per cent. solutions have been injected without producing irritant symptoms.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 575,277 (Jan. 12, 1897; expires 1914).

ARGYROL—Silver Vitellin.—Argyrol is a compound of a derived proteid and silver oxide, containing from 20 to 25 per cent. of silver.

The so-called vitellin is said to be prepared by electrolytic decomposition of serum albumin. To this product, finely suspended in water, is added freshly precipitated, moist silver oxide and the mixture is heated under pressure until combination occurs. The liquid is then evaporated to dryness *in Vacuo*. The change in the proteid is in question; probably a compound of hydrolyzed proteid (serum albumin) and silver oxide is formed.

Argyrol occurs in black, glistening, hygroscopic scales, freely soluble in water and glycerin, insoluble in oils and alcohol. The solution is yellowish or black, depending on concentration, and is not affected by boiling. Solutions of argyrol stain the skin. It gives a slight cloudiness or precipitate with sodium chloride and hydrochloric acid; on addition of ferric chloride the color is discharged with formation of a white cloud. With alkali and copper sulphate it gives a slight bluret reaction. It has a slight metallic taste. Silver is recognized in the usual way.

The compound is said to be incompatible with acids and most of the neutral and acid salts in strong solution.

Actions and Uses.—Solutions of argyrol (20 to 50 per cent.) are said to be non-irritating to mucous membranes. Taken internally it is said to be non-toxic. It is claimed to be an antiseptic. It is recommended in urethritis and cystitis, in conjunctivitis and in affections of the nose, throat and ear.

Dosage.—It is employed in from 10 to 25 per cent., and even stronger solutions.

Manufactured by A. C. Barnes Co., Philadelphia. U. S. trademark.

ARSANILIC ACID AND ITS DERIVATIVES

Arsanilic acid is derived from arsenic acid, $AsO.(OH)_3 = H_3AsO_4$, by replacing one hydroxyl by aniline (phenylamine); related compounds are made by substituting derivatives of aniline.

ARSACETIN.—Arsacetin is sodium acetyl arsanilate, $C_6H_4(NH.CH_3CO)(AsO.OH.CNa) + 4H_2O$ a compound derived from sodium arsanilate by replacing a hydrogen atom of the amino group in sodium arsanilate, with an acetyl radicle.

Arsacetin is a white crystalline substance, odorless, tasteless, and soluble to the extent of 10 per cent. in cold and 30 per cent. in hot water. It is free from arsenious or arsenic acid and solutions are not affected by boiling. It may be heated for an hour at 130° C. in the autoclave without undergoing decomposition.

If 1 part Arsacetin be dissolved in 10 parts water and a few drops of silver nitrate solution added, a pure white precipitate is formed.

The salt moistened with dilute hydrochloric acid and heated on platinum wire colors the flame yellow.

If a mixture of 0.1 Gm. Arsacetin, 0.5 Gm. dry sodium carbonate and 0.5 Gm. potassium nitrate be melted in a porcelain crucible, the white mass dissolved in 10 Cc. water and the solution neutralized with dilute nitric acid, a portion of the liquid yields a white crystalline precipitate on addition of an equal volume of magnesia mixture. A further portion of the neutral liquid furnishes a brown precipitate, soluble in ammonia and also in nitric acid, on addition of a few drops of silver nitrate solution.

If 0.2 Gm. Arsacetin be heated with 5 Cc. rectified spirit and 5 Cc. sulphuric acid, the odor of acetic ether is developed.

The aqueous solution of Arsacetin (1:10) should be clear and colorless, possess at most a faintly acid reaction and after addition of 5 Cc. dilute hydrochloric acid the liquid should not be altered by freshly prepared hydrogen sulphide solution.

If 0.1 Gm. Arsacetin be dissolved in 20 Cc. water, 1 Cc. dilute hydrochloric acid and 2 drops sodium nitrite solution added and filtered, an alkaline β-naphthol solution should produce no red coloration in the filtrate. An aqueous solution (1:20) to which 20 Cc. magnesia mixture is added, should afford no turbidity or precipitate within two hours.

0.5 gm. powdered Arsacetin, after heating for 4 hours at 110°-120° C., should show a loss in weight of about 20 per cent.

Action and Uses.—See Sodium Arsanilate. It is claimed to be less toxic than sodium arsanilate and it possesses the advantage of keeping well and being sterilizable without decomposition.

Dosage.—For hypodermic injection 0.1 Gm. (1½ grains) to 0.5 Gm. (7½ grains). For internal administration 0.05 Gm. (¾ grain) 3 to 4 times daily.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York.) U. S. trademark No. 75,046.

SODIUM ARSANILATE—Sodii Arsanilas.—Sodium Aniline Arsonate. Sodium Aminophenyl Arsonate. Sodium arsanilate, $C_6H_4(NH_2)$ $(AsO.OH.ONa) = C_6H_7O_3NAsNa$, is the sodium salt of arsanilic acid, $C_6H_4(NH_2)$ $(AsO.(OH)_2)$, 1:4.

It is prepared by condensing aniline and arsenic acid, eliminating water and isolating the arsanilic acids. The sodium salt is prepared by the usual methods.

Sodium arsanilate occurs as white, odorless crystals soluble in (5 or 6 parts) of water and is more soluble in warm water. It has a faint salty taste. On standing, the aqueous solution assumes a yellowish tint.

Sodium arsanilate crystallizes with somewhat varying amounts of water of crystallization. The arsenic content varies in different preparations from 23 to 26 per cent.

An acid solution of sodium arsanilate is not affected by hydrogen sulphide in the cold; when the solution is warmed the arsenic may be completely precipitated by hydrogen sulphide. If a solution of sodium arsanilate is treated with hydrochloric acid and potassium iodide, iodine is set free. The resulting liquid, whether freed of iodine or not, gives, even in the cold, a precipitate of arsenic sulphide when treated with hydrogen sulphide.

The arsenic and water content of sodium arsanilate may be determined by the methods given in THE JOURNAL A. M. A., Sept. 21, 1907, p. 1041.

An aqueous solution of the salt gives with mineral acids a white precipitate of arsanilic acid, soluble in excess of acid. An aqueous solution of the salt gives with silver nitrate solution a white precipitate of silver arsanilate. An aqueous solution of the salt, after the addition of hydrochloric acid and sodium nitrate gives a deep red coloration with a solution of β-naphthol in caustic soda.

Actions and Uses.—The arsenic of the arsanilic acid is liberated very slowly in the system, thus producing the ordinary therapeutic effects of arsenic, with a more continuous and less toxic action and less irritation. Toxic effects from excessive doses have been frequently noted, although the toxicity of sodium arsanilate is stated to be about 1/40 of that of arsenic trioxide. The poisonous effects appear to be due largely to the arsenic component, the aniline taking no part in them. It is claimed that the use of sodium arsanilate is not followed by irritation, abscess formation, etc., which sometimes follow the use of other preparations of arsenic. The use of sodium arsanilate in large doses has occasionally been followed by degeneration of the optic nerve, leading to blindness.

Sodium arsanilate has been recommended for the conditions which are favorably influenced by arsenic, such as anemia, nervous affections and diseases of the skin. It is said to have been very successful as a remedy for trypanosomiasis, both of animals and of man, and is also said to be useful in other protozoal diseases, such as syphilis, malaria, kala-azar, etc.

Dosage.—0.02 to 0.2 Gm. (⅓ to 3 grains) hypodermically every other day, gradually increasing, if necessary, until the single dose reaches 0.65 Gm. (10 grains) and until a total of 6.5 Gm. (100 grains) have been given. The drug should not be given by the mouth, as it is decomposed by the acid contents of the stomach, and toxic symptoms may result.

Proprietary preparations:

Sodium arsanilate was first introduced in the form of *Atoxyl.*

ATOXYL.—Atoxyl is sodium arsanilate containing about 26 per cent. of arsenic and corresponding closely to the formula $C_6H_4(NH_2)$. $(As.O.OH.ONa)+3\ H_2O$. It is a white powder having the properties given above.

Manufactured by Vereinigte Chemische Werke Actiengesellschaft, Charlottenburg, Germany. (Victor Koechl & Co., New York.) U. S. trademark No. 38,879.

Atoxyl Hypodermic Tablets, 1/3 grain.—Each tablet contains atoxyl 0.02 Gm. (⅓ grain).

SOAMIN.—Soamin is a form of sodium arsanilate containing approximately 22 per cent. of arsenic and corresponding to the formula $C_6H_4(NH_2)$. $(AsO.OH.ONa)+5\ H_2O$. It is a white crystalline substance having the properties given above.

Manufactured by Burroughs, Wellcome & Co., London, Eng., and New York. British trademark No. 302,133; U. S. trademark applied for.

Tabloid Soamin, 5 grains.—Each tablet contains soamin 0.3 Gm. (5 grains).

Tabloid Soamin, 1 grain.—Each tablet contains soamin 0.065 Gm. (1 grain).

ARSENOFERRATIN—Sodii Arsenoferrialbuminas.—Sodium Arsenoferrialbuminate.—Arsenoferratin is an arsenic iron albumin compound, obtained by introducing the element arsenic into the molecule of ferrialbuminic acid. Arsenoferratin contains iron in the ferric state, in organic combination equivalent to 6 per cent. metallic iron and arsenic, equivalent to 0.06 per cent. elementary arsenic.

Arsenoferratin is a brown, almost odorless and tasteless powder. It is soluble in water and easily soluble in dilute alkaline solutions.

Actions and Uses.—Arsenoferratin has the pharmacologic action of organic compounds of iron and of arsenic.

Dosage.—0.5 Gm. (7½ grains) three to four times daily.

Manufactured by C. F. Boehringer & Soehne, Waldhof, Mannheim, Germany. (Merck & Co., New York). Not patented. U. S trademark No 24,228.

Arsenoferratin Tablets.—Each tablet contains arsenoferratin 0.25 Gm. (4 grains).

Arsenoferratose.—Liquor Ferratini Arsenati.—Arsenoferratose is a 5 per cent. solution of arsenoferratin.

Arsenoferratin, 5 parts, is dissolved with the aid of a small quantity of sodium hydroxide in water, 68 parts, glycerin, 20 parts, alcohol, 6 parts, and Angostura essence, 1 part.

Dosage.—4 to 8 Cc. (1 to 2 fluidrams) three to four times daily.

For the determination of Iron and Arsenic in Arsenoferratose, the following methods are furnished:

Twenty-five Cc. of arsenoferratose are evaporated to a viscid consistency in a capacious tared crucible and the residue heated in a drying oven at 100 degrees C. for three hours to constant weight. After the crucible and its contents have been allowed to cool in a desiccator, it is weighed. The weight of the evaporated residue multiplied by 4 should be about 23. The weighed residue is now carefully incinerated, and finally ignited. After it has cooled, it is moistened with nitric acid, and again ignited, and finally taken up with 10 Cc. hydrochloric acid. The solution is diluted with 30 Cc. water, and when cold, 3 Gm. potassium iodide are added and the mixture allowed to stand for an hour in a well-stoppered bottle at the ordinary temperature. It is then titrated with decinormal sodium thiosulphate solution. The iodine liberated should require about 12.5 Cc. of tenth normal thiosulphate solution.

Fifty Cc. of the arsenoferratose contained in a distillation flask ated to about one-third of its original volume. To the residue are of about 500 Cc. capacity, are heated on a water bath and evapornow added 80 Cc. of arsenic-free concentrated hydrochloric acid and 20 Cc. arsenic-free, 25 per cent. solution of ferrous chloride, and the arsenic chloride distilled over, the receiver being kept well cooled by means of cold water. The contents of the receiver are then supersaturated with sodium bicarbonate, and the arsenic then titrated with the tenth-normal iodine solution: 0.4 Cc. decinormal iodine solution should be required, corresponding to a content of 0.003 Gm. in 100 Cc. arsenoferratose.

ARSEN-TRIFERRIN—Arsentriferrinum.—Arsen-Triferrin is an iron aresnoparanucleate containing arsenic in organic combination and standardized to contain a definite amount of arsenic by diluting with iron paranucleate. It should contain about 16 per cent. of iron, 0.1 per cent. of arsenic (As.), and 2.5 per cent of phosphorus, all in organic combination.

Arsen-Triferrin is an orange colored, tasteless powder, soluble in dilute alkalies from which it can be precipitated by the addition of an acid. It is also soluble in about 8 per cent. of hydrochloric acid on warming.

The determination of the amount of iron, arsenic and phosphorus in arsentriferrin is carried out according to the method in "Prüfungsvorschriften für die pharmazeutischen Spezialpräparate." (Knoll & Co.)

Actions and Uses.—Arsen-Triferrin passes through the stomach unchanged and undissolved, but is dissolved in the intestines and absorbed. This behavior prevents injurious action of arsenic on the gastric mucous membrane.

Arsen-Triferrin is said to be useful in cases of anemia which are rebellious to iron alone, and in neurasthenia, hysteria, and in skin diseases.

Dosage.—5 grains three times a day after meals.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany and New York (Merck & Co., New York). U. S. trademark No. 36,747.

Arsen-Triferrin Tablets, 5 grains.—Each tablet is said to contain arsen-triferrin 0.3 Gm. (5 grains).

Arsen-Triferrol. Elixir Arsen-Triferrini. Arsen-Triferrol is an elixir of arsen-triferrin containing in each 4 Cc. (1 fluidram) about 0.06 Gm. (1 grain) of arsen-triferrin in a menstruum containing 15 per cent of alcohol. It is prepared by dissolving a soluble form of arsen-triferrin in a vehicle consisting of water, alcohol, tincture of orange, compound tincture of cardamom and vanillin.

ASPIRIN.—Acidum Acetylsalicylicum.—Acetylsalicylic Acid. Acidum Acetylosalicylicum (Pharm. Helvetica, edit. 4; Pharm. Danica, 1907; Pharm. Svecica, edit. 9; Pharm. Hungarica, edit. 3)—Acidum Acetylsalicylicum (Pharm. Française, 1908)—Acetylsalicylic acid, $C_6H_4(CH_3CO).COOH, 1:2 = C_9H_8O_4$, is the acetyl derivative of salicylic acid.

It is prepared by the prolonged heating of 50 parts of salicylic acid and 75 parts of acetic anhydride at about 150° C. (302° F.)

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under a reflux condenser, and subsequent purification, by recrystallization from chloroform.

It forms small, colorless, crystalline needles, melting at 135° C. (275° F.), odorless and having an acidulous taste. It is soluble in 100 parts of water and freely soluble in alcohol or ether. It is readily split up on boiling with water or with alkalies with the production of acetic acid and salicylic acid or a salicylate.

It forms clear, colorless solutions, which do not develop a violet color on the addition of ferric chloride unless previously hydrolysed by boiling with sodium hydroxide. It gives no reaction with silver nitrate, and should leave no residue when heated on platinum foil.

It is incompatible with heat, moisture, alkalies, their carbonates and bicarbonates. It keeps well when properly protected.

Actions and Uses.—It acts like salicylic acid, over which it possesses the advantage of producing less of the undesired local and systemic side effects, on account of the slow liberation of the salicylic acid. It is claimed to pass the stomach unchanged, the decomposition beginning in the intestine.

Dosage.—0.3 to 1 Gm. (5 to 15 grains) in capsules or wafers, or dissolved in sweetened water, or dry on the tongue, followed by a swallow of water. The powder should be dispensed in wax paper.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 644,077 (Feb. 27, 1900; expires 1917). U. S. trademark No. 32,805.

BARIUM CHLORIDE—Barii Chloridum.—Baryum Chloratum (Pharm. Germanica, edit. 4; Pharm Helvetica, edit. 4). Barium Chloride ($BaCl_2 2H_2O$) is the barium salt of hydrochloric acid.

Barium chloride occurs as colorless trimetric plates or glistening scales, odorless, non-efflorescent and having an unpleasant, bitter, sharp, saline taste. It dissolves in 2.5 parts cold and in 1.5 parts boiling water, forming a neutral solution; but is insoluble in alcohol. Barium chloride becomes anhydrous when dried at 120° C. (248° F.).

An aqueous solution of the salt yields, with diluted sulphuric acid, a heavy white precipitate, insoluble in strong acids, and with silver nitrate a curdy, white precipitate, insoluble in nitric acid but readily soluble in ammonia water. Diluted alcohol, after remaining in contact with the salt for several hours, should, on ignition, give a pure yellowish-green flame free from red (absence of traces of strontium). An aqueous solution of barium chloride should not be precipitated by ammonium sulphide nor should any residue remain after adding excess of diluted sulphuric acid to the solution, filtering, and evaporating to dryness. Twenty Cc. of the aqueous solution (1 to 20) must not turn blue on the addition of 0.5 Cc. of potassium ferrocyanide T. S.

Action and Uses.—Barium chloride is a toxic substance, its most striking effects being exerted upon muscle tissue, especially unstriped and heart muscle. In large doses it affects the spinal cord and medulla. By actively stimulating peristalsis, through action on the muscle wall, and by its direct irritant action, it readily produces vomiting and purging. It strengthens the cardiac contraction by direct action on the heart muscle, and by this means and still more by direct action on the vessel walls it greatly increases blood pressure, acting like digitalis. It acts on the muscles like veratrin. It first greatly excites and then paralyzes the spinal cord and medulla. Given in very dilute solution, absorption is small and the barium is deposited in the bones. Injected intravenously it causes tonic and clonic spasms, because of stimulation of the spinal cord and medulla.

In fatal doses it causes hemorrhages into the stomach, intestines and kidneys.

Its clinical use has been attended with little success, chiefly because of the gastrointestinal irritation and high toxicity. It has, however, been used in cardiac disease with insufficient blood pressure, as a general "tonic," and with less reason in tremors, in scleroses of the central nervous system, internally and locally in varicose veins, etc.

In poisoning the most direct antidote against the portion remaining in the gastrointestinal tract is sodium sulphate, which produces insoluble barium sulphate.

Its use is attended with considerable danger.

Dosage.—0.006 to 0.003 Gm. (1/10 to ½ grain) or 2 to 4 Cc. (30 to 60 minims) of a 1 per cent. solution (5 grains to the fluidounce). Fatal, 0.80 to 0.90 Gm. (13-15 grains). It should always be well diluted before giving.

Internally used in syphilis, scrofula and tumor albus in doses of 0.03-0.10 Gm. (½ to 1½ grains) 3 to 4 times per day; for heart disturbances 0.2-0.4 Gm. (3 to 6 grains) per day. Maximum dose per day 0.6 Gm. (9 grains). Externally employed as an eye-wash in scrofulous eye affections in 10 per cent. solution.

BENZOSALIN. — Methylis Benzoyl-Salicylas.—Benzoyl-Salicylic-Acid-Methylester—Methyl Benzoyl-Salicylate. Benzosalin is methyl benzoyl salicylate $C_6H_4O(CH_3).COO(C_6H_5CO)$, $1:2 = C_{15}H_{12}O_4$, the benzoyl salicylic acid ester of methyl alcohol.

Benzosalin is prepared by a reaction between the methylester of salicylic acid and benzoyl chloride in the presence of sodium hydroxide. The resulting product is washed with water and after drying is crystallized out from alcohol.

Benzosalin consists of fine, white crystals with a very faint aromatic odor. It melts at about 85° C. (185° F.). It burns leaving no residue. It dissolves readily in chloroform, benzene and in 35 parts of 90 per cent. cold alcohol, also in pure concentrated sulphuric acid.

Actions and Uses.—Benzosalin is said to pass the stomach unchanged and to be decomposed into its constituents, benzoic and salicylic acids in the intestines. It is said to be free from the undesirable by-effects of salicylic acid. It is claimed that benzosalin is an intestinal antiseptic.

Benzosalin is said to be useful in rheumatic affections, such as arthritis, neuralgia, sciatica and migraine, and in arthritis deformans.

Dosage.—0.5 to 1 Gm. (7½ to 15 grains). Daily dose 3 to 4 Gm. (45 to 60 grains) in powder or tablets.

Manufactured by F. Hoffmann-La Roche & Co., Basel, Switzerland. (The Hoffmann-La Roche Chemical Works, New York.) U. S. Patent No. 799,706 (Sept. 19, 1905; expires 1922). Controlling Benzoyl Salicylic Acid. Name "Benzosalin" registered No. 58,757.

Benzosalin Tablets, 5 grains.—Each tablet contains benzosalin 0.3 Gm. (5 grains).

BERBERINE HYDROCHLORIDE. — Berberinæ Hydrochloridum.—Berberine hydrochloride is the hydrochloride, $C_{20}H_{17}NO_4 HCl + 2H_2O$, of an alkaloid obtained from *Hydrastis canadensis* and *Berberis vulgaris*.

Berberine hydrochloride occurs as bright yellow acicular crystals of amorphous powder, slightly soluble in alcohol to which it imparts a deep yellow color. It is soluble in 300 parts cold water, but dissolves more easily in hot water.

An aqueous solution of berberine or its salts treated with chlorine or bromine water produces a blood red color. Bromine water in excess precipitates the reddish-brown berberine tetrabromid-hydrobromide—$C_{20}H_{17}NO_4Br_4HBr$, which is converted by washing with alcohol or heating to 100° to the yellow-brown berberine dibromide-hydrobromide $C_{20}H_{17}NO_4Br_2HBr$.

Ammonium sulphide precipitates from an alcoholic solution of berberine sulphate the polysulphide $(C_{20}H_{17}NO_4)_2H_2S_5$ which crystallizes in brown-black needles.

Berberine solutions even if very dilute when treated with potassium iodide solution yield a yellow precipitate of berberine hydroiodide.

Action and Uses.—Given by mouth, it acts as a bitter stomachic. Very large doses, although not fatal, cause diarrhea, tremors, general weakness, low blood pressure (from depression of vasomotor center and of cardiac muscle), rapid pulse (depression of vagus endings) and respiration. Recovery is slow. Nephritis may be present. Subcutaneous injection kills by paralysis of respiration, with symptoms of asphyxia and paralysis. It has been used as a bitter tonic for diarrhea, the vomiting of pregnancy and as a febrifuge.

Dosage.—0.06 Gm. to 0.3 Gm. (1 to 5 grains). As much as 20 grains have been taken without obvious effect other than a loose stool.

BETANAPHTHOL BENZOATE—Naptholis Benzoas.—Benzonaphthol. Benzoyl-Beta-Naphthol.—Beta-naphthol benzoate is beta-naphthyl benzoate, $C_6H_5.COO.C_{10}H_7 = C_{17}H_{12}O_2$, the benzoic ester of beta-naphthol.

Beta-naphthol benzoate is obtained by heating beta-naphthol and benzoyl chloride together at 170° C. (338° F.), extracting the product with alcohol, and crystallizing.

It forms colorless needles, or a white crystalline powder, colorless and tasteless, melting at 107-110° C. (224.6-230° F.). It is almost insoluble in water, but readily soluble in alcohol and in ether; also soluble in chloroform, in glycerin and in olive oil.

It is decomposed by heating with caustic alkalies into naphthol and a benzoate which will then give their characteristic reactions.

To test beta-naphthol benzoate for the presence of beta-naphthol it should be shaken several times with dilute solution of sodium hydroxide (1:10) and immediately filtered. If beta-naphthol is present in considerable amount it will separate as a turbidity or precipitate after acidifying with dilute sulphuric acid. If the amount of beta-naphthol is small no precipitate appears, but the alkaline solution shows a bluish fluorescence and if it is boiled with chloroform a green color is produced.

A solution of beta-naphthol benzoate should not give a violet color with chloride of lime or solution of iodine and alkali.

It is incompatible with antipyrine, camphor, phenol, ferric chloride, menthol, potassium permanganate, or ethyl carbamate (urethane).

If 1 Gm. beta-naphthol benzoate be shaken with 10 Cc. water and the solution filtered, the filtrate acidified with nitric acid, should not become turbid on addition of silver nitrate solution.

Beta-naphthol benzoate heated on a platinum foil should leave no weighable residue.

Actions and Uses.—Beta-naphthol benzoate is split up into its constituents on reaching the intestinal tract and is believed to act as an antiseptic. It is said to be diuretic. It is used internally as an intestinal antiseptic in diarrhea and typhoid fever. Externally it is said to be useful as a parasiticide in the form of 3 to 10 per cent. ointment, and has been used in psoriasis, eczema, scabies, etc.

NOTE: Wide difference of opinion exists among authorities as to the actual efficiency of any intestinal antiseptics and most urinary antiseptics. Whatever opinion regarding this is followed, it should be remembered that if used freely or for a long time any of them may have irritating effects upon the digestive tract or undesirable effects upon other tissues. Reasonable caution should therefore be exercised in using them.

Dosage.—0.2 to 0.5 Gm. (3 to 8 grains); maximum dose, single, 1 Gm. (15 grains), daily 4 Gm. (60 grains).

Non-proprietary preparations:

Beta-naphthol Benzoate, Heyden. Manufactured by Fabrik von Heyden, Radebeul near Dresden, Germany (Merck & Co., New York). Not patented or trademarked.

Benzonaphthol, Farbwerke. Manufactured by Farbwerke, vorm. Meister Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). Not patented or trademarked.

BETOL—Naphtholis Salicylas.—Naphthalol—Naphthol-Salol—Salinaphthol.—Betol is beta-naphthyl salicylate, $C_6H_4.OH.COO(C_{10}H_7)=C_{17}H_{14}O_3$, the salicylic acid ester of beta-naphthol.

Betol is obtained by heating beta-naphthol-sodium and sodium salicylate with phosphorus oxychloride at 120°-130° C. (248° to 266° F.).

It is a white, shining crystalline powder, colorless and tasteless melting at 95° C. (203° F.). It is insoluble in cold or hot water or glycerin, difficultly soluble in cold alcohol or turpentine, easily soluble in boiling alcohol, in ether, in benzene, and in warm linseed oil. In the cold it is not changed by acids or alkalies of moderate concentration. When heated with alkalies it is decomposed into its constituents, which, if the solution is acidulated, will crystallize.

It is distinguished from salol by its higher melting point and by the production of a brownish-green color, when a trace of nitric acid is added to its yellow colored solution in pure sulphuric acid. It burns on platinum foil, leaving no residue (absence of fixed mineral impurities).

If 1 Gm. of betol is shaken with 30 Gm. of boiling water and filtered through a moistened filter, the filtrate should not have an acid reaction (absence of salicylic, hydrochloric or phosphoric acid) nor should it after cooling show a crystalline deposit (salicylic acid or beta-naphthol) and should not become turbid on the addition of silver nitrate (chlorides or phosphates) or barium nitrate (absence of sulphate) nor should it give a violet color with solution of ferric chloride.

Actions and Uses.—Betol undergoes no change in the stomach, but is split up into its original compounds when it reaches the intestinal tract by the pancreatic juice and intestinal secretions. It is believed to act as an intestinal antiseptic and, being excreted in the urine, to act in a similar way in the bladder. (See note under Beta-Naphthol Benzoate.)

It has the antirheumatic properties of salicylic acid. It is said to be useful for intestinal fermentations, catarrh of the bladder, particularly in gonorrheal cystitis, for rheumatism, etc.

Dosage.—0.3 to 0.5 Gm. (4 to 8 grains) in cachets, milk or emulsion.

Manufactured by the Heyden Chemical Works, New York. U. S. trademark.

BILE SALTS

The bile of man and of several animals contains in varying proportions the sodium salts of conjugated cholic acids; in ox and human bile especially glycocholic acid $C_{26}H_{43}O_6N$; and taurocholic acid, $C_{26}H_{45}O_7NS$. **Fresh ox gall is said to contain about 3 per cent. each of sodium glycocholate and sodium taurocholate.**

The sodium glycocholate and taurocholate may be separated in the following manner: Dry ox bile is treated with absolute alcohol and the tincture precipitated by ether in excess. Both salts are deposited and the glycocholate crystallizes upon standing, the taurocholate remaining in amorphous form, resembling oily or resinous matter. If the deposit is dissolved in water, solution of lead acetate will throw down a lead glycocholate, while the addition of lead subacetate to the remainder will precipitate the taurocholate (U. S. Dispensatory, p. 490).

Tests: All the bile acids respond to Pettenkofer's test. A small portion of the salt is dissolved in a little concentrated sulphuric acid in a small porcelain dish and warmed, care being taken that the temperature does not rise higher than 60° to 70° C. A 10 per cent solution of cane sugar is then added drop by drop while the liquid is stirred with a glass rod. If compounds of cholic acid are present a beautiful red color will appear, which does not disappear at room temperature, but usually in the course of a day becomes bluish violet. The red liquid shows in the spectrum two absorption bands, one at F and the other between D and E near to E. Care must be taken not to heat too much nor to add too much sugar. The sulphuric acid must be free from sulphurous acid and the lower oxides of nitrogen. As albumin, oleic acid, amyl alcohol, morphine, etc., may give a similar reaction, spectroscopic examination should not be omitted in doubtful cases (Hammarsten, Lehrbuch der physiolog. Chemie, p. 312).

Furfurol Test (Mylius): The substance is dissolved in alcohol and for every one cubic centimeter of the alcoholic solution, one drop of a 1:1000 furfurol solution and one Cc. of concentrated sulphuric acid are added and the mixture cooled, if necessary, so that the temperature may not rise too high. The same color reaction occurs as in Pettenkofer's test.

Actions and Uses.—The bile salts constitute the main active principles of bile, and therefore share the actions and uses of the latter, perhaps with the advantage of more constant composition. When injected into the circulation they cause severe nervous and cardiac depression, not observed when they are given by mouth. They are generally credited with a slight antiseptic and laxative action, with enhancing the efficiency of the resinous hydragogue cathartics, and with emulsifying and hence favoring the absorption of fat. They stimulate the secretory activity of the liver, increasing both the fluids and solids of the bile. While they are regarded as the most powerful of the so-called cholagogues, it is doubtful if even their effect is very pronounced.

They may be used in obstructive jaundice, although the rationale is somewhat doubtful; their use in biliary fistula is more reasonable, if the nutrition is noticeably affected.

Proprietary Preparations:

BILEIN—Sodii glyco-taurocholas bovis—Abbott.—Bilein is the name given to a mixture of the essential salts of the bile.

Actions and Uses.—See Bile Salts.

Manufactured by the Abbott Alkaloidal Co., Chicago. U. S. trademark No. 44,140.

Bilein Pills, 1/4 grain.—Each pill contains bilein 0.015 Gm. (1/4 grain).

Bilein Pills, 1/8 grain.—Each pill contains bilein 0.008 Gm. (1/8 grain).

Bilein Pills, 1/12 grain.—Each pill contains bilein 0.006 Gm. (1/12 grain).

BILE SALTS-Fairchild.—Bile salts-Fairchild is a preparation obtained from fresh ox-gall, consisting essentially of sodium glycocholate and sodium taurocholate, in the proportion existing in ox bile.

Action and Uses.—See Bile Salts.

Dosage.—0.13 to 0.4 Gm. (2 to 6 grains); 4 to 5 Gm. (60 to 75 grains), per day.

Manufactured by Fairchild Bros. & Foster, New York.

COLALIN.—Colalin consists essentially of a mixture of hyoglycocholic and hyotaurocholic acids, obtained from bile. To preserve the pulverulent condition a little magnesium carbonate is added.

Colalin is a yellow powder of faint odor and persistent bitter taste. It melts at 103° to 107° C. It is slightly soluble in water and acid toward litmus.

Colalin should be readily soluble in alcohol and this solution should rotate polarized light to the right. It should dissolve almost entirely in a dilute solution of sodium carbonate with evolution of carbon dioxide and in a dilute solution of sodium hydroxide. The solution in sodium hydroxide should not be rendered turbid by the addition of barium hydroxide T. S. (absence of fatty acids). It should not contain more than a trace of sulphur (absence of taurin).

Actions and Uses.—See Bile Salts, above.

Dosage.—0.015 to 0.030 Gm. (1/4 to 1/2 grain) three to four times daily; for children from 0.008 to 0.015 Gm. (1/8 to 1/4 grain).

Manufactured by Rufus Crowell & Co., Somerville, Mass. (Schieffelin & Co., New York).

Colalin Tablets, 1/2 grain.—Each tablet contains colalin 0.03 Gm. (1/2 grain).

Colalin Tablets, 1/4 grain.—Each tablet contains colalin 0.015 Gm. (1/4 grain).

Colalin Tablets, 1/8 grain.—Each tablet contains colalin 0.008 Gm. (1/8 grain).

BISMUTH SUBCARBONATE PREPARATIONS.

CREMO-BISMUTH—Mistura Bismuthi Subcarbonatis Hydrati, Mulford.

Cremo-bismuth is a mixture said to consist of bismuth subcarbonate suspended in water in a finely divided state, each 100 Cc. representing the equivalent of 8.66 Gm. (40 grains in one fluid ounce) of bismuth subnitrate.

Dosage.—4 to 16 Cc. (1 to 4 fluidrams) every two or three hours.

Prepared by the H. K. Mulford Co., Philadelphia. U. S. trademark No. 29,335.

LAC BISMO—Mistura Bismuthi, Hart.—Lac Bismo is a mixture said to consist of bismuth hydroxide and bismuth subcarbonate, suspended in water, in a finely divided state, and containing 0.16 Gm. (2½ grains) of the salts in 4 Cc. (1 fluidram).

Dosage.—4 to 16 Cc. (1 to 4 fluidrams).

Prepared by E. J. Hart & Co., Ltd., New Orleans, La. U. S. trademark.

BISMUTH SUBGALLATE PREPARATIONS.

BISMUTH SUBGALLATE.—Bismuth subgallate is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physicians Manual of the Pharmacopeia and the National Formulary.

AIROL—Bismuthi Iodosubgallas—Bismuth Oxyiodogallate. Airoform.—Airol. $C_6H_2(OH)_3(COOBiI(OH) = C_7H_6O_6IBi$., is a combination of bismuth oxyiodide (subiodide) and gallic acid.

It is prepared by heating molecular quantities of bismuth subgallate and hydriodic acid or bismuth oxyiodide and gallic acid, in the presence of water, until a grayish-green product results, which is drained and dried.

It is a voluminous grayish-green, odorless and tasteless powder, insoluble in alcohol, ether, chloroform, and olive oil, slightly soluble in glycerin. It is practically insoluble in water, communicating to water a red color on standing, slowly in the cold, but readily when heated, being decomposed with liberation of iodine and bismuth subgallate. It is readily soluble, with decomposition, in dilute alkalies and mineral acids. It is decomposed on exposure to moist air, turning red, but in admixture with glycerin and a little water it long remains unaltered.

Airol may be identified by the appropriate tests for its components.

It is incompatible with water and calomel. It should not be exposed to moist air.

Actions and Uses.—As it liberates iodine in the nascent state in the presence of wound secretion it is said to be useful as a substitute for iodoform in the treatment of wounds, burns, skin diseases, gonorrhea, etc.

Dosage.—It is used externally in the pure state or diluted with talc, or in the form of a 10 per cent. suspension in equal parts of glycerin and water, or as a 10 to 20 per cent. ointment with 2 parts of petrolatum and 7 parts of wool fat.

Manufactured by F. Hoffmann-LaRoche & Co., Basel, Switzerland (The Hoffmann-LaRoche Chemical Works, New York). U. S. patent No. 544,104 (Aug. 6, 1895; expires 1912). German patents Nos. 80,399 and 82,593. U. S. trademark No. 79,760.

BISMAL—Bismuthi Methylen-Digallas.—Bismal, $4(C_{14}H_{12}O_{10})$, $3Bi(OH)_3 = Bi_3C_{56}H_{37}O_{34}$, is a compound of bismuth hydroxide and methylendigallic acid.

It is obtained by digesting 4 molecules of methylendigallic acid with three molecules of bismuth hydroxide in water.

It is a voluminous gray-brown powder, insoluble in water or gastric juice, but soluble in alkalies, forming yellowish red solutions.

Actions and Uses.—Bismal is an astringent and is said to be useful for the treatment of chronic diarrhea.

Dosage.—0.12 to 0.3 Gm. (2 to 5 grains) in cachets or powder.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 605,246 (June 7, 1898; expires 1915). German patent No. 87,059 (dropped in 1890).

BISMUTH AND IRON CITRATE (SOLUBLE), Wellcome Brand—Bismuthi et Ferri Citras, Wellcome.—Bismuth and iron citrate (soluble), Wellcome brand is a "scale salt" containing bismuth citrate and ferric citrate in amounts corresponding to from 38 to 40 per cent. each of the respective anhydrous salts (corresponding to 20 to 21 per cent. bismuth and 8.7 to 9.1 per cent. iron), the combination being rendered soluble in water by means of ammonia.

Bismuth and iron citrate (soluble) occurs in yellowish-green scales, readily soluble in water, having a saline, mildly ferruginous taste.

A solution of bismuth and iron citrate (soluble) is acid toward litmus; addition of dilute acids or of ammonia water renders the solution darker but does not cause precipitation; addition of sodium hydroxide T. S. causes formation of a reddish-brown precipitate and evolution of ammonia.

The iron content of bismuth and iron citrate soluble may be determined by the methods prescribed for ferri et ammonii citras U. S. P. The amount of bismuth is determined by precipitating by hydrogen sulphide from an acid solution, dissolving the bismuth sulphide obtained in dilute nitric acid, precipitating the bismuth from this solution by ammonium carbonate and weighing as bismuth oxide.

Actions and Uses.—It has the properties of iron and soluble bismuth salts. Its administration is proposed by the manufacturer in cases of dyspepsia accompanied by anemia, that the sedative action of bismuth may be exerted on the digestive organs, while the iron may combat the anemia.

Dosage.—0.3 to 0.65 Gm. (5 to 10 grains).

Manufactured by Burroughs, Wellcome & Co., London and New York. Not patented or trademarked.

BISMUTH AND LITHIUM CITRATE (SOLUBLE), Wellcome Brand—Bismuthi et Lithii Citras Solubilis, B. W. & Co.—Bismuth and lithium citrate (soluble), Wellcome brand, is a "scale salt" of bismuth and lithium citrate containing 40 to 45 per cent. of bismuth (Bi) and 2.5 to 3 per cent. of lithium.

Bismuth and lithium citrate (soluble) occurs in colorless scales, readily soluble in water. Its aqueous solution is acid toward phenolphthalein, but alkaline toward lithmus T. S.

Tests. If 1 Gm. of the salt is warmed with 10 Cc. potassium hydroxide no ammonia is evolved (absence of ammonium compounds).

Actions and Uses.—Recommended by the manufacturers as a convenient form of medication when the effects of both lithium and bismuth are desired, as in gouty dyspepsia.

Dosage.—0.13 to 0.3 Gm. (2 to 5 grains).

Manufactured by Burroughs, Wellcome & Co., London, England, and New York. Not patented or trademarked. patented in U. S.

BORNYVAL.—Bornyval is a name applied to capsules containing borneol isovalerate $C_{10}H_{17}O.C_5H_9O$, the isovaleric acid ester of borneol, 0.25 Gm. (4 minims).

It is prepared by the condensation of equal molecular quantities of borneol and isovaleric acid.

Borneol isovalerate is a clear aromatic liquid, having an odor resembling oil of rosemary and at the same time a weak odor and taste of valerian. It is insoluble in water, but dissolves in all proportions of alcohol and ether. The liquid boils at 255° to 260° C. (417° to 426° F.) under ordinary pressure. At a pressure of 50 mm. it boils at 150° to 170° C. (302° to 338° F.). Its specific gravity is 0.945 to 0.951; it is dextrorotatory. The alcoholic solution 1:10 after the addition of a drop of phenolphthalein solution should be distinctly reddened by a drop of tenth-normal alkali.

Actions and Uses.—As borneol isovalerate forms a large part of oil of valerian, its action is similar to that of the official drug. It reduces reflex excitability and acts as a nervous sedative.

It is said to be useful in the various neuroses, especially those of the circulatory, digestive and central nervous systems.

Dosage.—0.25 to 0.75 Gm. (4 to 12 minims) from two to four times daily. It is best given after meals with some milk, coffee or similar drink to avoid eructations.

Manufactured by J. D. Riedel, Aktiengesellschaft, Berlin, Germany (Riedel & Co., New York). U. S. trademark No. 56,451. Not patented in U. S.

BROMETONE.—Tribrom-Tertiary-Butylalcohol. — Acetone-Bromoform.—Brometone is 1,1,1-tribrom-2-methyl-propan-2-ol, $CBr_3.C(OH)(CH_3).CH_3 = C_4H_7OBr_3$, produced by the reaction of acetone on bromoform.

Made by the action of caustic alkalies on a mixture of bromoform and acetone.

Occurs in fine white, prismatic crystals which possess a camphoraceous odor and taste. It is slightly soluble in water, soluble in alcohol, ether, benzin and most organic solvents. It melts at about 167° F. (332.6° F.) and volatilizes on exposure to air.

Actions and Uses.—Brometone is claimed to have the sedative action of the bromides without the disadvantage of producing bromism. In doses of 0.3 Gm. (5 grains) four or five times a day, in adults, it is claimed to cause no unpleasant results and to produce no disturbance of the digestive organs, and to have no appreciable effect on the secretions. Its action

is prompt and its effect is manifest for several hours. In doses exceeding 1.6 Gm. (25 grains) daily it may produce dizziness, vertigo, anorexia, and mental hebetude, all of which symptoms disappear on discontinuance of its use. Therapeutically it has been said to be useful in mild conditions of excitation and insomnia, in so-called narcotic abstinence, in hysteria, and in nervous affections generally. It relieves some forms of cough and is said to produce amelioration in some cases of epilepsy. It has been used to relieve dizziness due to labyrinthine disturbances.

Dosage.—The dose is 0.3 Gm. (5 grains), dry or in capsules, to be repeated two or three times during twenty-four hours.

Manufactured by Parke, Davis & Co., Detroit, Mich. U. S. trademark.

BROMIPIN.—Brominized Sesame Oil. Merck.—Bromipin is a bromine addition product of sesame oil.

It is prepared by the action of bromine chlorid on sesame oil, in sufficient quantities, theoretically calculated, to produce the required bromination.

It is a yellow, oily liquid, having a purely oleaginous taste, and having a sp. gr. of 0.995 to 0.997.

If to 1 Cc. of bromipin in 1 Cc. of chloroform a few drops of phenolphthalein solution be added, the addition of one drop of half normal potassium hydroxide should produce a red color (limit of acidity). Estimation of bromine: 1 Gm. of bromipin 10 per cent., or 0.3 Gm. of bromipin 33⅓ per cent. is boiled with a solution of 2 Gm. of potassium hydroxide in 10 Cc. of alcohol until saponified. The solution is evaporated on a water bath, the residue is charred and the char is repeatedly extracted with small portions of water, and these are passed through a filter. To the filtrate 5 Cc. of nitric acid, 15 Cc. of tenth-normal silver nitrate and 1 Cc. ferric-ammonium sulphate test solution are added, and the excess of silver nitrate is determined with tenth-normal ammonium sulphocyanate. 1 Cc. tenth-normal silver nitrate=0.007936 Gm. of bromine.

Actions and Uses.—Bromipin acts like the bromides, but as it yields its bromine more slowly it is thought to have less tendency to produce brominism. The combination is not broken up in the stomach, but a portion of the bromine is split off as soon as the oil enters the intestine. The oil with the remaining bromine is easily absorbed, and, similarly to other fats, is largely deposited in the tissues, where it is slowly split up. It is said to be more lasting in its action than the bromides.

Dosage.—1.3 Gm. (20 grains) of 33 1-3 per cent. bromipin or 4 Cc. (1 fluidram) of 10 per cent., which may be increased in cases of epilepsy to from 2.6 to 10.4 Gm. (40 to 160 grains) of 33 1-3 per cent. bromipin or from 8 to 32 Cc. (2 to 8 fluidrams) of 10 per cent. bromipin. The liquid may be given in emulsion with peppermint water and syrup, or pure, flavored with oil of peppermint.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 774,224 (Nov. 8, 1904; expires 1921). German patent No. 96,495.

Bromipin, 10 per cent.—Bromipin, 10 per cent. is a 10 per cent. brominized sesame oil.

Bromipin, 33⅓ per cent.—Bromipin, 33⅓ per cent. is a 33⅓ per cent. brominized sesame oil.

Capsules of Bromipin, 33⅓ per cent.—Each capsule contains bromipin 33⅓ per cent. 2 Gm. (30 grains).

Tablets of Bromipin, 33⅓ per cent.—Each tablet contains bromipin 33⅓ per cent. 1.2 Gm. (19 grains).

BROMO-MANGAN—Liquor Ferro-Mangani Bromopeptonati "Dieterich."—Bromo-mangan is Ferro-mangan Dieterich with the addition of 3 per cent. of bromopeptone. Bromopeptone contains 11 per cent. of bromine.

The process of preparation is the same as that given under Ferro-mangan "Dieterich" with the addition of a solution of bromopeptone.

Bromo-mangan is a clear dark brown liquid of agreeable odor and taste.

Method of Valuation: After determination of the percentage of iron and manganese, a test method should be employed as described by Dr. Karl Dieterich in Helfenberg Annals, 1901, pages 162-165, to ascertain the percentage of halogens in bromopeptone: About 0.5 bromopeptone should thoroughly mixed with a few grammes of a mixture of 1 part potassium nitrate and 2 parts sodium carbonate, either in a porcelain or platinum crucible. The mixture is then covered with a light layer of sodium carbonate, covered and carefully heated until reaction sets in. When finished a little potassium nitrate is added to obtain a smooth flux, then the molten mass is exposed to glowheat for about 15 minutes. After cooling the mass is dissolved in hot water, rinsed into a beaker, filtered, if necessary, acidulated with diluted acetic acid and bromate present reduced with sulphurous acid. The excess of acid is driven off by the heat, the liquid strongly acidulated with nitric acid, again heated, until the gas formation ceases, then precipitated while hot with silver nitrate. The silver bromide is collected on a weighed filter, washed with very dilute ammonia water, as the preparation contains hydrochloric acid, dried and weighed.

Actions and Uses.—Bromo-mangan is said to be a reconstructive tonic, blood-making adjuvant and a sedative.

It is claimed to be useful when anemia is associated with nervous disturbances, as in epilepsy, neurasthenia, hysteria, etc.

Manufactured by Chemische Fabrik Helfenberg A. G., near Dresden, Germany (Reinschild Chemical Co., New York). U. S. trademark No. 44,333.

BROMURAL. — Bromural ($CH_3.CH(CH_3)CHBr.CO)HN.CO.NH_2 = C_8H_{13}N_2O_2Br$, is 2-monobrom-isovaleryl-urea obtained by the interaction of urea with brom-isovaleryl bromide.

Bromural forms small, white, almost tasteless needles which are easily soluble in hot water, ether, alcohol and alkalies, but less readily in cold water. It sublimes on heating and melts in the neighborhood of 145° C. (293° F.).

Bromural can be precipitated from a 10 per cent. sodium hydroxide solution with acids. The presence of bromine may be demonstrated with fusion with sodium carbonate and potassium nitrate and testing for a bromide with silver nitrate solution. On heating the alcoholic solution of bromural with sodium ethylate for several hours on the water bath, sodium bromide will precipitate. If this be filtered off and the filtrate evaporated, a crystalline mass will remain which can be recrystallized from water. This is dimethylacrylic acid, melting at 280° C.

If 1 Gm. bromural be boiled for about 1 minute with 10 per cent. solution of sodium hydroxide, ammonia obtained from the urea will be given off.

If the hot liquid be then cooled, acidified with nitric acid and extracted with ether, and the ether evaporated an oily fluid, 1-brom-isolvaleric acid, which has the specific odor of valeric acid, will remain.

The bluret reaction cannot be obtained. On melting bromural and adding concentrated sodium hydroxide solution and copper sulphate, no color reaction will take place.

Actions and Uses.—Bromural is a nerve sedative which is claimed to produce sleep without markedly affecting the circulation or respiration. All action by bromural is said to cease after from three to five hours. In many cases, however, the sleep caused by the preparation continues beyond the limits of its action. It is claimed to be useful as a nerve sedative and for the purpose of inducing sleep in functional nervous diseases. Bromural does not produce the desired effects in cases of insomnia where pain, cough, angina pectoris and excitement or delirium exist.

Dosage.—As a nerve sedative 0.3 Gm. (5 grains) three times daily; as a specific at bedtime, 0.6 Gm. (10 grains), which dose may be repeated if needful during the night, after the action of the first dose has ceased.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany (Knoll & Co., New York. Merck & Co., New York). U. S. patent No. 914,518 (March 9, 1909; expires 1926). U. S. trademark No. 61,165. German patent No. 185,962.

Bromural Tablets, 5 grains.—Each tablet contains bromural 0.3 Gm. (5 grains).

BROVALOL.—Brovalol is bornyl brom-valerate, $CH_3.CH(CH_3).CHBr.COO(C_{10}H_{17}) = C_{15}H_{25}O_2Br$, the brom-isovaleric-acid ester of borneol. It contains 25.2 per cent. bromine.

Brovalol is obtained by esterification of borneol with bromisovaleric acid or its derivatives.

Brovalol is a colorless, oily liquid, having a slight aromatic odor. Under 10 mm. pressure it boils at 163° C. (325.4° F.). It is insoluble in water but soluble in alcohol, chloroform and ether.

Action and Uses.—Brovalol acts as an analeptic, antispastic and nervine. It is claimed to be well tolerated even in large doses and to possess greater sedative power than similar valeric acid derivatives, due to its bromine content.

Dosage.—0.25 to 0.75 Gm. (4 to 12 grains) several times a day. It is supplied only in capsules (pearls), each containing 0.25 Gm. (4 grains).

Manufactured by Chemische Fabrik auf Actien vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 930,054 (Aug. 3, 1909; expires 1926). U. S. trademark applied for.

BUTYL-CHLORAL HYDRATE—Butyl-Chloral Hydratum.—Trichlorbutylidene Glycol—Croton Chloral Hydrate—Butyl-Chloral Hydras (British Pharm., 1908). Butyl-chloral Hydrate is 2, 2, 3-trichlorbutan-1, 1,-di-ol. $CH_3.CHCl.CCl_2.CH(OH)_2 = C_4H_7O_2Cl_3$, a crystalline product obtained by the addition of water to the liquid butyl chloral (2, 2, 3,-trichlorbutanol, $CH_3.CHCl.CCl_2.CHO$).

Butyl-chloral hydrate occurs in pearly white, trimetric laminæ, having a pungent but not acrid odor, and an acrid, nauseous taste. It fuses at about 77.8° C. (172° F.) to a transparent liquid, which, in cooling, commences to solidify at about 71.1° C. (160° F.). It is soluble in about 50 parts of water, and its own weight of glycerin or of alcohol (90 per cent.); it slowly dissolves in 20 parts of chloroform. From a solution in alcohol it is precipitated by the gradual addition of water, in the form of glob-

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ules said to consist of butyl chloral alcoholate $C_4H_7Cl_3O.C_2H_5OH$. The alcoholic solution is neutral and the aqueous solution neutral or but slightly acid to litmus. It gives no precipitate with test-solution of silver nitrate. It does not yield chloroform when heated with solution of potassium hydroxide or with milk of lime (absence of chloral hydrate).

Actions and Uses.—Its action is similar to that of chloral, except that it is said to be less depressing and more analgesic. It has been especially recommended for facial neuralgia.

Dosage.—0.3 to 1.3 Gm. (5 to 20 grains).

CALCIUM LACTATE—Calcii Lactas.—Calcium lactate, Ca $(C_3H_5O_3)_2.5H_2O$, is the calcium salt of lactic acid.

It is prepared in the manufacture of lactic acid by the lactic acid fermentation of sugar or by the neutralization of lactic acid by calcium carbonate.

It occurs in white crystalline masses or powder, odorless and tasteless. It is soluble in 9.5 parts of water, easily soluble in hot water. At 100° C. (212° F.) it loses water of crystallization.

If calcium lactate be heated gently with a mixture of sulphuric acid and potassium permanganate the odor of aldehyde will be given off. An aqueous solution of calcium lactate will throw down a white precipitate, insoluble in water and acetic acid, on the addition of a solution of ammonium oxalate.

Actions and Uses.—Calcium lactate has the pharmacologic action of other calcium salts. Being less irritating than the chloride, it may be given subcutaneously. It is used in the belief that it will increase the coagulability of the blood.

CALOMELOL—Hydrargyri Chloridum Mite Colloidale.—Colloidal Calomel.—Calomelol is a soluble colloidal form of calomel, containing albuminoids.

According to the patent it is prepared by acting on a solution of sodium chloride in presence of a proteid with mercurous nitrate and precipitating the water soluble colloidal calomel by means of alcohol. The precipitate is washed with alcohol, redissolved in water with the aid of a little alkali, and from this solution the colloidal calomel is obtained either by evaporation or by precipitation with alcohol.

It forms a white-gray, odorless and tasteless powder, containing 80 per cent. of mercurous chloride and 20 per cent. of proteids. It is soluble in water, forming an opalescent solution; insoluble in alcohol, ether and benzene. It is precipitated from its aqueous solutions by acids, the precipitate being redissolved by alkalies.

Actions and Uses.—Its action is the same as that of calomel but it is claimed to be superior because of its solubility in water, acting more rapidly and efficiently, and to be non-irritant and particularly non-toxic. The indications for its use are the same as for calomel.

Dosage.—Internally the same as calomel. Externally it is used as a dusting powder, mixed with an equal quantity of starch or of a mixture of starch and zinc oxide, or in the form of calomelol ointment. It should be guarded from the light.

Manufactured by the Heyden Chemical Works, New York. U. S. patent No. 740,855 (Oct. 6, 1902; expires 1920). U. S. trademark.

Calomelol Ointment.—Calomelol Ointment is an ointement containing 28 per cent. of mercury in the soluble form of calomelol (which see) and 2 per cent. in the insoluble form.

It is prepared by combining 45 parts of calomel with sufficient lard to make 100 parts.

Dosage.—6 Gm. (90 grains) daily for inunction in syphilis.

CARBOSANT.—Santalolis Carbonas.—Carbosant is santalyl carbonate, $CO(OC_{15}H_{23})_2 = C_{31}H_{46}O_3$, the carbonic acid ester of santalol.

Carbosant is produced by the chemical interaction of santalol with carbonyl chloride, $COCl_2$, and alkalies, or with carbonic acid esters.

Carbosant is an oily yellow fluid, almost tasteless and odorless, insoluble in water, and soluble in alcohol and ether. It contains 94 per cent. of santalol.

Carbosant is saponified when heated with an alcoholic solution of caustic alkali with the production of potassium carbonate and santalol, both of which can be identified by appropriate tests.

Actions and Uses.—The action of carbosant which is chemically broken up into its component parts in the intestine is identical with that of santalol, the active constituent of official sandal wood oil. It tends to diminish the secretions of the mucous membrane of the urinary tract, and to relieve pain in the urinary organs.

Carbosant is said to be useful in the treatment of gonorrhea, cystitis and prostatitis.

Dosage.—0.6 Cc. (10 minims) three times daily. It may be given in capsules, each containing 0.3 Gm. (5 grains), 2 capsules being given three times daily.

Manufactured by the Chemische Fabrik von Heyden at Radebeul near Dresden, Germany. (Heyden Chemical Works, New York.) German patent No. 182,627. Not patented in the United States. U. S. trademark applied for.

CEPHÆLINE—Cephæline.—Cephæline is an alkaloid, $C_{11}H_{28}NO_2$, obtained from ipecacuanha root.

Cephæline occurs as snow-white, fine, interlacing needles which readily turn yellow. It is soluble in ether and caustic soda solutions, melts at 96°-102° C. (204.8°-215.6° F.) and turns brown when heated to 120° C. (248° F.). With Fröhde's reagent, a freshly prepared solution of 0.1 Gm. sodium molybdate in 10 Cc. concentrated sulphuric acid, it gives a purple color which hydrochloric acid changes to prussian blue.

Actions and Uses.—These are identical with those of ipecac. It is relatively more emetic and less nauseant and causes relatively more renal irritation and less cardiac depression. It may be employed as an emetic and expectorant.

Dosage.—0.005 to 0.01 Gm. (1/12 to 1/6 grain) in pills or as a powder triturated with sugar of milk. The hydrochloride is soluble.

CHINOSOL.—Normal Oxychinolin Sulphate.—Chinosol is a normal oxychinolin sulphate $(C_9H_7ON)_2H_2SO_4$.

Chinosol is a yellow crystalline powder of saffron-like odor and burning taste. It melts at from 175° to 177.5° C. (347° to 351.5° F.). It dissolves readily in water but with difficulty in alcohol and it is insoluble in ether. The aqueous solution has an acid reaction.

A drop of solution of ferric chloride produces in a solution of chinosol a marked green coloration. Barium chloride produces a white precipitate. Solutions of alkaline hydroxides precipitate from an aqueous solution of chinosol a white precipitate, consisting of interlaced crystalline needles, which after filtration, washing and careful drying in a desiccator should melt at from 73° to 75° C. On incineration chinosol should not leave a weighable residue.

Actions and Uses.—So far as experimental evidence goes, chinosol is nontoxic. It is a powerful antiseptic, slightly stronger in this respect than mercuric chloride and considerably stronger than phenol. It exerts an antiseptic action in solutions containing 1 part to 5,000. It is a feeble germicide being weaker than phenol and much weaker than mercuric chloride.

Dosage.—For internal use 0.3 Gm. (5 grains) three times daily. As an antiseptic the average strength of solution is 1 to 1,000; as a nasal or vaginal douche, the strength should be 1 part to 5,000, and as an eye-wash 1 to 8,000, gradually increasing the strength of the solution according to the sensitiveness of the patient.

Manufactured by Franz Fritzsche & Co., Hamburg, Germany (Chinosol Co., Parmele Pharmacal Co., New York). U. S. patent No. 906,918 (Dec. 15, 1908; expires 1925). U. S. trademark No. 28,750.

CHLORALFORMAMIDE.

Chloralformamide is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physicians' Manual of the Pharmacopeia and National Formulary.

CHLORALAMID.—A name applied to Chloralformamidum, U. S. P.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany. (Schering & Glatz, New York). German patent No. 50,536; U. S. patents Nos. 429,039 and 429,040 (expired).

CHLORAL HYDRATE PREPARATIONS

ANTIPYRINE CHLORALHYDRATE—Antipyrinæ Chloralhydras.—Monochloral-Antipyrine.—Antipyrine Chloralhydrate, $C_{11}H_{12}N_2O.CCl_3CH(OH)_2 = C_{13}H_{19}N_2O_3Cl_3$, is antipyrine combined with one molecule of hydrated chloral.

It is prepared by triturating molecular proportions of antipyrine and hydrated chloral together, dissolving the resultant oily liquid in hot water and allowing the solution to cool.

It occurs in colorless octahedral crystals or a white crystalline powder, melting at 67° C. (152.6° F.). It is soluble in 10 to 11 parts of cold water, easily soluble in hot water, and in 3.5 parts of alcohol, forming neutral solutions.

The aqueous solution gives the usual reaction for antipyrine (a blood-red color with ferric chloride) and for hydrated chloral (turbidity and separation of chloroform when warmed with caustic alkali). Ammoniacal silver nitrate is reduced with the formation of a silver mirror, but the aqueous solution (1:10) acidified with nitric acid is not altered by silver nitrate nor precipitated by hydrogen sulphide. Antipyrine Chloralhydrate dissolves in concentrated sulphuric acid without coloration and leaves no weighable residue when incinerated on platinum.

It is incompatible with alkalies, their carbonates and bicarbonates and with metallic salts.

Actions and Uses.—Antipyrine Chloralhydrate is an analgesic and hypnotic resembling chloral in its action, but said to be less liable to produce injurious effects on the vasomotor

center or the heart. It may be used where chloral is indicated, as in mild forms of mental excitement, incipient delirium tremens, and also in insomnia caused by pain.

Dosage.—1 to 2 Gm. (15 to 30 grains); although supposed to be less toxic than chloral, larger doses up to 3 Gm. (45 grains) should be used with caution. It may be given dissolved in water (1:10) flavored with syrup of orange or aromatic elixir.

Manufactured by Farbwerke, vorm. Meister, Lucius and Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York).

CHLORBUTANOL. — Trichlor-Tertiary-Butylalcohol — Acetone-Chloroform.—Chlorbutanol is 1,1,1-trichlor-2-methyl-propan-2-ol, $CCl_3.C(OH)(CH_3)$. $CH_3 = C_4H_7OCl_3$, produced by the reaction of acetone on chloroform.

Made by the action of caustic alkalies on a mixture of chloroform and acetone. It is a white, crystalline, volatile compound having a camphoraceous odor and taste. It is soluble in water (8-1000), in fixed and volatile oils, and glycerin; very soluble in alcohol, ether, benzin, glacial acetic acid, chloroform and acetone.

Actions and Uses.—It is said to be absorbed unchanged from the alimentary tract, but to be decomposed in the body. It is a local anesthetic with an action weaker than that of cocaine, but sufficient frequently to prevent vomiting from gastric irritation. Its antiseptic action is said to be fifteen times as strong as that of boric acid. It acts on the central nervous system similarly to chloral, and although the claim has been made that hypnotic doses are without effect on the circulation and respiration independent observers have described a fall of blood pressure and interference with respiration in animals, and consider it fully as dangerous as chloral. In man 100 grains caused severe symptoms, but recovery occurred. It is claimed that no habit is induced, but this may be referable to its restricted employment. It is said to be useful as a mild local anesthetic in dentistry, etc., as a preservative for hypodermic solutions; for insomnia, vomiting, and for spasmodic conditions. It is also said to be useful as introductory to general anesthesia, lessening excitement and nausea.

Dosage.—0.3 to 1.5 Gm. (5 to 20 grains) dry or in capsules. Hypodermically as a local anesthetic a saturated aqueous solution may be used.

Proprietary Preparations:

CHLORETONE.—A name applied to chlorbutanol by Parke, Davis & Co., Detroit, Mich. U. S. trade-mark.

Chloretone Inhalant.—Chloretone (chlorbutanol), 1 Gm.; camphor, 2.5 Gm.; menthol, 2.5 Gm.; oil of cinnamon, 0.5 Gm.; refined liquid petroleum, 93.5 Gm.

Actions and Uses.—An anodyne, antiseptic, and emollient solution for use by inhalation as a very fine spray or nebula.

METHAFORM.—A name applied to chlorbutanol by F. Stearns & Co., Detroit, Mich. U. S. trade-mark.

CITARIN.—Sodium Anhydromethylene Citrate.

Citarin, $CO(CH_2COONa)_2CO = Na_3C_7H_4O_7$ is the normal sodium salt of anhydromethylene-citric acid.

Anhydromethylene-citric acid is obtained by reacting on citric acid with paraformaldehyde (German patent No. 129,255) or with chlormethyl alcohol, CH_2ClOH (German patent No. 150,949). The sodium salt is obtained by treating the acid with sodium hydroxide solution and precipitating the resulting salt with alcohol (U. S. patent No. 715,329).

It is a white, granular, somewhat hygroscopic powder, having a faintly saline and acidulous taste, and a slightly acid reaction. It is readily soluble in about 1.5 parts of water, but insoluble in alcohol. Its solutions split off formaldehyde when heated, particularly in the presence of alkalies, and mineral acids separate from its concentrated solutions methylenecitric acid.

Formaldehyde can be demonstrated by means of Jorrisson's reaction, or by sodium nitrite and sulphuric acid, or by silver nitrate and soda solution.

It is incompatible with acids and alkalies and is decomposed by heat.

Actions and Uses.—This is one of the compounds which it is claimed increase the elimination of uric acid by forming very soluble compounds with that substance. It is claimed to be useful for gout and chronic rheumatism

Dosage.—1 to 2 Gm. (15 to 30 grains), largely diluted with water.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 715,329 (Dec. 2, 1902; expires 1919).

Citarin Tablets, 15 grains.—Each tablet contains citarin 0.97 Gm. (15 grains).

COLLARGOL — Collargolum.— Colloidal Silver — Argentum Colloidale—Argentum Credé.—Collargol is a water-soluble, allotropic form of metallic silver, said to contain 85-87 per cent. of silver, and a small percentage of albumin with products of its oxidation.

Collargol occurs as small, hard, brittle, bluish-black, scale-like pieces. It is soluble in 20 parts of distilled water, producing a dark olive-brown solution which remains stable for months. No separate silver particles can be distinguished in the solution even when magnified to the highest degree under the microscope, and it has all the other characteristics of a solution. The addition of albumin to collargol prevents or delays its precipitation by acids and salts. A sufficient amount of albumin to prevent its precipitation under ordinary conditions is therefore added to collargol during its manufacture. Hence collargol, even when dissolved in spring or well water containing salts, undergoes no change, and it remains unaffected by boiling, whereas colloidal silver, containing no albumin, precipitates on being boiled.

A solution of collargol does not respond directly to the usual tests for silver. If the solution is warmed with nitric acid a white cloudiness is produced, which clears completely on standing and the silver can then be demonstrated in the usual manner. On heating a fragment of collargol on a platinum scoop, shining white metallic silver of the ordinary kind, insoluble in water, is at once formed.

Its solution should not be exposed to light or air; it is incompatible with the usual silver reagents.

Actions and Uses.—Collargol is claimed to be a systemic antiseptic and germicide.

Dosage.—In most cases it is best employed locally in the form of a 15 per cent. ointment (see Collargol ointment), 2 to 4 Gm. (30 to 60 grains) being very thoroughly rubbed into the skin; otherwise, in carefully filtered solutions, varying in strength according to the intended use; 2 per cent. to 5 per cent. for intravenous injections, 1/50 per cent. to 1 per cent. solutions for washes; 5 per cent. dusting powder, prepared with finest clay; in the form of bougies containing 0.2 Gm. (3 grains), and vaginal suppositories and tampons each containing 0.05 Gm. (¾ grain), for parenchymatous injections in 0.5 per cent. to 1 per cent. glycerin solutions. Internally a solution of 1:500 to 1:100 is given freely in teaspoonful doses added to the food, in infectious gastric and intestinal diseases. It is also given in tablets containing 0.06 Gm. (1 grain).

Manufactured by the Heyden Chemical Works, Radebeul, Germany, and Garfield, N. J. (Schering & Glatz, New York). U. S. trademark No. 32,452.

Collargol Ointment—Unguentum Credé.—Ointment of Colloidal Silver.—Collargol Ointment is an ointment containing 15 per cent. of collargol.

It is prepared by incorporating 15 parts of collargol with 5 parts of water, 10 parts of white wax, and 70 parts of benzoinated lard, observing care that the soluble silver shall not be transformed into metallic silver of the ordinary kind. This, it is asserted, it is prone to do unless great care is observed in the manipulation.

The natural color of collargol ointment is dark bluish-gray. The addition of water may impart to the ointment a brownish shade; this does not, however, in any way impair its efficiency. The ointment is good as long as it colors the skin black.

CONIINE HYDROBROMIDE—Coniinæ Hydrobromidum.—Coniine hydrobromide is the hydrobromide, $C_8H_{17}N.HBr$, of an alkaloid found in conium.

Coniine hydrobromide occurs as colorless, transparent, glistening rhombic crystals, or as a white crystalline powder, melting at 210-214° C. (410-417° F.). It is soluble in two parts of water, in three parts of alcohol, and in ether-alcohol, but insoluble in ether. The solutions are colorless and neutral. The salt contains 61.09 per cent. of coniine.

Evaporated with an excess of sulphuric acid, coniine hydrobromide becomes red, violet, blue and finally brown. An aqueous solution of the salt mixed with magnesium carbonate or oxide, and shaken with carbon bisulphide, colors the latter yellow. Addition of silver nitrate solution to a solution of coniine hydrobromide causes precipitation of yellow silver bromide; iodine test solution precipitates a reddish-brown body and tannic acid a yellowish-white compound. Coniine hydrobromide should burn when ignited, leaving no residue.

Actions and Uses.—Coniine hydrobromide paralyzes the peripheral endings of the motor nerves, producing an ever-increasing muscular weakness. To a less degree it affects the sensory nerves. With lethal doses consciousness is retained to the last. It probably depresses the spinal cord feebly and usually dilates the pupils. In therapeutic doses it is said to

increase the temperature but in lethal doses it lowers it: convulsions may appear and death results from paralysis of respiration.

Coniine hydrobromide may be used for the same purpose as conium. It has been tried in chorea, paralysis agitans, whooping cough, and is said to produce a condition of calm and relaxation in maniacal and hysterical excitement. It is a dangerous remedy.

Dosage.—0.001-0.003 Gm. (1/60 to 1/20 grain) three times a day. Maximum single dose 0.005 Gm. (1/12 grain); maximum daily dose 0.015 Gm. (¼ grain). For hypodermic use a 5 per cent. solution is used.

COPPER CITRATE.—Cuprum Citricum.—Cupric Citrate.—Copper citrate is the cupric salt of citric acid, containing 34 to 36 per cent. of copper.

It occurs as a green, or bluish-green, finely crystalline, odorless powder. It is but slightly soluble in cold water. Somewhat more soluble in a cold solution of an alkali citrate, forming a greenish blue solution. More soluble in a hot solution of an alkali citrate; also soluble in ammonia water and in mineral acids.

When dissolved in ammonia water copper citrate yields an intense blue solution.

When heated to 90° C. (194° F.) the salt loses water of hydration and assumes a pale blue color. At higher temperature it blackens and at a low red heat leaves a black residue of cupric oxide.

Copper citrate should contain copper equivalent to from 34 to 36 per cent. of metallic copper.

If about 1 Gm. of copper citrate be dissolved in 20 Cc. of diluted hydrochloric acid, the solution diluted to 200 Cc. with hot distilled water, the mixture saturated with hydrogen sulphide, filtered, and the filtrate evaporated nearly to dryness on the water bath, the residue should respond to the usual tests for citric acid.

If 0.5 Gm. of copper citrate be dissolved in 10 Cc. of diluted hydrochloric acid and 1 Cc. of barium chloride test solution be added no turbidity should at once occur (limit of sulphate).

A solution of 0.5 Gm. of the salt in 10 Cc. of diluted sulphuric acid should not evolve any odor of acetic acid when boiled.

The salt should be free from nitrates, chlorides and carbonates.

Actions, Uses and Dosage.—Copper citrate possesses the astringent and antiseptic properties of other salts of copper somewhat modified by its sparing solubility.

It may be used for the same purposes and in doses similar to those of other salts of copper.

Non-Proprietary Preparations:

Copper Citrate, Mallinckrodt.—Manufactured by the Mallinckrodt Chemical Works, St. Louis, Mo.

Copper Citrate Ointment, 5 per cent., M. E. S. Co.—An ointment containing 5 per cent. of copper citrate and 95 per cent. of white petrolatum, without alcohol or preservative. Manufactured by the Manhattan Eye Salve Co., Owensboro, Ky.

Copper Citrate Ointment, 10 per cent., M. E. S. Co.—An ointment containing 10 per cent. of copper citrate and 90 per cent. of white petrolatum, without alcohol or preservative. Manufactured by the Manhattan Eye Salve Co., Owensboro, Ky.

CORYFIN.—Ethylglycolic Acid Ester of Menthol.—Coryfin is menthyl ethylglycolate, $CH_3(O.C_3H_5).COO(C_{10}H_{19})$ = $C_{14}H_{26}O_3$, the ethylglycolic acid ester of menthol.

It is prepared by the action of ethyloxyacetyl chloride on menthol. Coryfin is a limpid, colorless oil, having a very faint menthol odor. It boils under 20 mm. pressure at about 155° C. (311° F.) and is soluble in alcohol, ether and chloroform; difficultly soluble in water.

When heated with caustic alkalies it is split up into menthal and ethylglycolic acid. When incinerated on platinum foil it leaves no residue. Aqueous solutions must not have an acid reaction and must be free from chlorine and sulphuric acid.

Actions and Uses.—Soon after its application to the skin or mucous membranes a cooling effect is produced, said to be due to the splitting off of menthol, to which the pharmacologic actions of the remedy are to be ascribed.

Coryfin is said to be useful as a substitute for menthol in nervous headaches, coryza and conditions of hoarseness and pharyngeal irritation.

Dosage.—In headache it may be lightly rubbed in or painted on the forehead, avoiding contact with the eyes; in coryza it may be applied to the mucous membrane with a brush or as a spray. In throat affections a few drops (3 or 4) may be placed on a lump of sugar and allowed to dissolve in the mouth, or mixed with tepid water and used as a gargle.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 836,914 (Nov. 27, 1906; expires 1923). U. S. trademark No. 42,416.

COTARNINE HYDROCHLORIDE—Cotarninæ Hydrochloridum.—Cotarnine Hydrochloride, $C_{12}H_{13}O_3N.NCl$, is the cotarnine salt of hydrochloric acid. Cotarnine is an oxidation product of narcotine, similar to hydrastinine.

It is prepared by boiling narcotine for a long time with water or by heating it with dilute nitric acid and converting the basic product obtained into the hydrochloride.

It is a yellow, crystalline powder, soluble in water and in alcohol. Its melting point is indefinite.

If to a solution of cotarnine hydrochloride tenth-normal Iodine V. S. is added, a brown precipitate of cotarnine periodide is produced, which if collected and dried over sulphuric acid melts at 140° C. (284° F.).

If to a solution of 0.1 Gm. cotarnine hydrochloride in 2 Cc. of water 3 drops of a 15 per cent. sodium hydroxide solution are added, each drop will produce a milk-white precipitate which dissolves on agitation. After a time the free base separates from the clear solution, leaving the supernatant liquid clear and but faintly yellow. The base, after recrystallization from benzene, melts, with decomposition, at 130° C. (266° to 269.6° F.).

Actions and Uses.—Cotarnine hydrochloride is a hemostatic, analgesic and uterine sedative. The mechanism of its action is obscure.

It is said to be useful particularly in functional dysmenorrhea of puberty and of the climacteric; in subinvolution of the uterus after parturition and abortion, as well as in all profuse uterine hemorrhages; in bleeding from the bladder, from the nose, after extraction of teeth, etc.

Dosage.—Internally 0.05 Gm. (¾ grain) four to five times daily. Because of its intensely bitter taste, it is best given in the form of coated tablets, pills, or capsules; or by hypodermic injection (in urgent cases) 2 Cc. of a 10 per cent. solution; externally, as a styptic, pure or in strong solution.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

COTARNINE PHTHALATE—Cotarninæ Phthalas.—Cotarnine phthalate $(C_{12}H_{13}O_3N)_2C_6H_4(COOH)_2$, is the cotarnine salt of phthalic acid.

The base cotarnine, obtained from narcotine by oxidation with dilute nitric acid, is combined with phthalic acid to form the neutral salt.

It is a yellow, microcrystalline powder, easily soluble in water. The base is recognized by the tests given under cotarnine hydrochloride.

Actions and Uses.—Cotarnine phthalate is said to have hemostatic and pronounced sedative properties. Its modus operandi is unknown. Its action resembles that of cotarnine hydrochloride, but phthalic acid compounds have especial hemostatic properties. Cotarnine phthalate is said to be useful in uterine hemorrhage.

Dosage.—Internally in sugar-coated tablets of ¾ grain each, 3 to 5 tablets a day (up to 9 tablets a day in cases of dysmenorrhea). Locally as a dusting powder. By subcutaneous injection (3 grains dissolved in 30 minims of water) for quick arrest of severe hemorrhage.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. U. S. patent No. 742,532 (Oct. 27, 1903; expires 1920).

CREOSOTE CARBONATE.—Creosote Carbonate is a mixture of carbonic acid esters, analogous to guaiacol carbonate, prepared from creosote.

It is prepared by passing a current of carbonyl chloride into a solution of creosote in sodium hydroxide, and purifying the oily product by washing with weak soda solution and with water.

It is a yellowish, thick, honey-like, perfectly clear and transparent liquid, containing 92 per cent. of creosote. It is odorless and has a bland oily taste. It is insoluble in water, but soluble in alcohol, ether, chloroform, benzene and in fixed oils.

The addition of a few drops of ferric chloride solution to the alcoholic solution should not cause any change in color. On boiling with potassium hydroxide solution the odor of creosote is evolved.

It is incompatible with alkalies.

Actions and Uses.—Creosote Carbonate has the same action as creosote, but is claimed to be non-toxic and devoid of irritant properties. It is recommended as a substitute for creosote for internal exhibition in tuberculosis, pneumonia, and as an intestinal antiseptic.

NOTE: The Council would note that any claims of non-toxicity that are made for drugs that have or are supposed to have important general effects are admitted to this book only when they do not conflict with known facts. In all such instances, however, it is recommended that a lack of toxicity be not accepted too freely but be considered to mean only that toxic effects have not as yet been recognized with the doses that have been studied. The most sincere and apparently justified beliefs concerning this point are often ultimately reversed by extended experience. Much the same may be said regarding any claims that drugs are non-irritating.

Dosage.—From 0.3 to 2.0 Gm. (5 to 30 grains) for children, to 1 to 4 Gm. (15 to 60 grains) for adults in milk, coffee, wine, cod-liver oil or emulsion. Externally it may be applied undiluted.

Proprietary Preparations:

CREOSOTAL.—A name applied to Creosote Carbonate.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 501,235 (expired); U. S. trademark.

CREOSOTAL-Heyden.—A name applied to Creosote Carbonate.

Manufactured by Fabrik von Heyden, Radebeul, near Dresden, Germany (Schering & Glatz, New York). U. S. patent No. 501,235 (expired). U. S. trademark.

DIASPIRIN.—Diaspirin is succinyl disalicylic acid, $CO(O.C_6H_4.COOH).CH_2.CH_2.CO(O.C_6H_4.COOH)$.

Diaspirin is a salicylic acid derivative, produced by the interaction of the two carboxyl groups of succinic acid with the phenolic hydroxyls of two molecules of salicylic acid, with the elimination of 2 molecules of water, thus: $COOH.CH_2.CH_2.COOH + 2HO.C_6H_4.COOH = CO(O.C_6H_4.COOH).CH_2.CH_2.CO(O.C_6H_4.COOH) + 2H_2O$.

It is prepared by the action of succinyl dichloride upon salicylic acid.

Diaspirin is an odorless and almost tasteless white crystalline powder, said to melt at about 178° C. (352.4 F.) (Specimens examined by the Council were found to melt at 168° C. Corr.) Soluble with difficulty in cold alcohol and glacial acetic acid; scarcely soluble in water. By heating with caustic alkalies it decomposes into succinate and salicylate. Diaspirin is a dibasic acid which reacts with bases, organic or inorganic, to form salts.

Diaspirin produces the effects of salicylates. The following special claims are made for it: That it passes unchanged through the stomach, producing no irritation, but is split into its constituents in the intestine; that it exerts a strong diaphoretic effect.

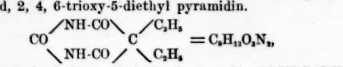
Actions and Uses.—The same as those for salicylic acid.

Dosage.—1 Gm. (15 grains) three or four times daily.

Manufactured by the Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany. (Farbenfabriken, of Elberfeld Co., New York). U. S. patent No. 874,929 (Dec. 31, 1907; expires 1924). U. S. trademark applied for.

DIETHYL-BARBITURIC ACID AND COMPOUNDS

VERONAL — Veronalum. — Acidum diæthyl-barbituricum. Diethyl malonyl urea. Malo-urea. Veronal is diethyl-barbituric acid, 2, 4, 6-trioxy-5-diethyl pyramidin.



$= C_8H_{12}O_3N_2$,

a ureide derived from diethylmalonic acid, $COOH.C(C_2H_5)_2.COOH$, and urea, $CO(NH_2)_2$.

It may be prepared by the interaction of esters of diethylmalonic acid with urea in the presence of metallic alcoholates. (U. S. patent No. 782,739.) It is also obtained by condensation of diethylcyanacetic ester with urea by means of sodium alcoholate.

It is a white, crystalline powder, melting at about 188° C. (370.4° F.), odorless and faintly bitter. It is soluble in about 150 parts of cold water, and in about 12 parts of boiling water. It is quite soluble in ether, acetone and ethyl acetate; also slightly soluble in chloroform, petroleum benzin, acetic acid and amyl alcohol. It forms salts with alkalies which are soluble in water.

Prolonged heating with sodium carbonate solution liberates ammonia. Denninges' reagent produces a white precipitate; Millon's reagent produces in solution acidulated with nitric acid a precipitate soluble in an excess of the reagent.

Actions and Uses.—Diethyl-barbituric acid is quickly absorbed, especially when it is given in solution. In small doses it induces sleep apparently without any other effect. In larger doses the temperature falls and animals show marked trembling and restlessness in their sleep. In small doses it is a relatively safe hypnotic, but fatalities have followed its indiscriminate use.

It is used in simple insomnia, as well as in that accompanying hysteria, neurasthenia and mental disturbances.

Dosage.—0.3 to 1 Gm. (5 to 15 grains) in hot water, tea or milk, or, if in wafers or capsules, followed by a cupful of some warm liquid.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany, and E. Merck, Darmstadt, Germany. (Farbenfabriken of Elberfeld Co., New York, and Merck & Co., New York.) U. S. patent No. 782,739 (Feb. 14, 1905; expires 1922). U. S. trademark.

Veronal Tablets, 5 grains.—Each tablet contains veronal 0.33 Gm. (5 grains).

SODIUM DIETHYL-BARBITURATE.—Sodii Diæthyl-barbituras.—Sodium diethylbarbiturate, Na $(C_8H_{11}O_3N_2)$ is the mono-sodium salt of diethyl-barbituric acid.

Sodium diethyl-barbiturate occurs as a white, crystalline powder, soluble in 5 parts of water at 15° C. and in about 2 parts of boiling water. The aqueous solution of the salt has a bitter alkaline taste.

The salt contains 11.18 per cent. sodium (Na) and should yield about 89 per cent. (theory requires 89.31 per cent.) diethyl-barbituric acid (JOURNAL, Jan. 23, 1909, vol. 52, p. 311).

Action and Uses.—The same as diethyl-barbituric acid, but claimed to act more rapidly on account of its greater solubility. Because of its solubility, administration by rectal injection and also subcutaneous injection has been proposed.

Dosage.—The same as diethyl-barbituric acid, which see. It should be administered in aqueous solution.

Proprietary Preparations:

MEDINAL.—Medinal is a name applied to sodium diethyl-barbiturate.

Manufactured by Chemische Fabrik auf Actien vorm E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 780,241 (Jan. 17, 1905; expires 1922); 879,499 (Feb. 18, 1908; expires 1925). U. S. trademark applied for.

Medinal Suppositories, 7½ grains. Each suppository contains medinal 0.5 Gm. (7½ grains) incorporated with oil of theobroma.

Medinal Tablets, 5 grains.—Each tablet contains medinal 0.33 Gm. (5 grains).

VERONAL-SODIUM.—Veronal-sodium is a name applied to sodium diethyl barbiturate.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany, and E. Merck, Darmstadt, Germany. (Farbenfabriken of Elberfeld Co., New York, and Merck & Co., New York). U. S. patent and trademark. (See Veronal.)

Veronal-Sodium Tablets, 5 grains.—Each tablet contains veronal-sodium 0.32 Gm. (5 grains).

Prepared by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany. (Farbenfabriken of Elberfeld Co., New York.)

DIGESTIVE FERMENTS.

Valuation of Ferments: Qualitative tests for the activity of ferments can be easily applied, but such qualitative results have very little importance. Quantitative results also are important only in so far as they permit comparison with other ferments; and for this purpose the minutest details of the methods must be accurately observed. After investigation, the Council has decided to employ the following quantitative methods in its work:

1. ***Amylolytic Power:*** **(For diastases, malt and pancreas preparations.) The Council does not approve the methods which are based on the time of change from blue to red color given by iodin; or the time of disappearance of all color; but instead it has adopted as the standard the amount of starch that can be converted to colorless end point in 10 minutes, by a given weight of the product, working according to the details described. (THE JOURNAL A. M. A., July 11, 1908, p. 140, and Journal Am. Chem. Soc., 1908, Vol. 30, p. 798.)**

2. ***Proteolytic Power in Alkaline Media:*** **(For trypsin and pancreatic preparations.) The approved methods are based on the quantity of fibrin or coagulated egg albumen, which is dissolved by a given weight of the substance, in a slightly alkaline medium and in a given time.**

3. ***Proteolytic Power in Acid Media:*** **(For pepsin and gastric preparations.) This is determined by the U. S. P. method.**

4. ***Milk-Curdling Power:*** **(For rennet and gastric preparations.) The method is based on the quantity required to coagulate 100 Cc. of milk.**

Incompatibilities: **Ferments are more or less rapidly destroyed by boiling, by alcohol, by many salts, by unsuitable reaction of vehicle, by putrefaction, and by proteolytic digestion. Solutions of ferments tend to deteriorate on keeping.**

Ferments are generally destroyed by each other, and also during their sojourn in the stomach; little therapeutic action can be secured beyond this organ, at least under ordinary conditions.

Therapeutic Indications.—The digestive ferments are used outside the body to predigest food. They are often applied locally for the softening of dead tissues or the solution of false membranes. They are administered internally for the purpose of supplementing or replacing deficient or absent normal secretions. In such cases they should be administered in such manner and at such times as to secure the most favorable conditions for their action. Diastases should be given with the food or before the stomach becomes highly acid. Trypsin and other ferments which are to act in the intestine should be given near the end of gastric digestion with sufficient alkali to neutralize the acid of the gastric juice. There is little if any reliable evidence that these latter ferments have any activity except in cases in which hydrochloric acid is absent from the stomach contents. In cases which present a total or nearly total lack of acid in the stomach they may be given with alkali at meal time or soon after the meal is taken.

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PANCREATIC PREPARATIONS.

DIAZYME ESSENCE.—A liquid stated to contain the amylolytic enzyme of the pancreas, devoid of trypsin and lipase in a menstruum containing 18.5 per cent. of alcohol by volume.

Diazyme essence is an amber fluid of aromatic taste and odor and slightly acid reaction.

One Cc. will convert 200 Gm. of pure starch mucilage, containing 8 Gm. of dry starch, the mixture being kept at 40° C., so that the solution will cease to give a color reaction with iodine at the end of ten minutes.

Actions and Uses.—Diazyme is capable of digesting starch and is claimed to be useful to compensate for deficient salivary and pancreatic action in the digestion of starch.

Dosage.—4 to 8 Cc. (1 to 2 fluidrams).

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark No. 44,878.

DIAZYME GLYCEROLE.—A liquid stated to contain the amylolytic enzyme of the pancreas, devoid of trypsin and lipase, in a menstruum containing about 60 per cent. of glycerin by volume.

It is a dense amber fluid, of agreeable taste and odor, and of slightly acid reaction.

One Cc. will convert at 40° C. 200 Gm. of pure starch mucilage, containing 8 Gm. dry starch, so that the solution will cease to give a color reaction with iodin in 10 minutes.

Actions, Uses and Dosage.—See Diazmye Essence.

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark No. 44,878.

GLYCEROLE TRYPSIN-Armour.—Glycerole trypsin is a 70 per cent. glycerin solution containing approximately 5 per cent. of trypsin powder.

Glycercole trypsin-Armour is prepared directly from the fresh pancreas of the hog.

It is a yellowish to brownish clear liquid of sweetish taste and peculiar characteristic color. Its incompatibilities are the same as those of trypsin. It should be kept in a cool place.

The strength of glycerole trypsin is tested in the same way as that of trypsin, using 3 to 5 Cc. of glycerole trypsin for 10 Gm. of moist blood fibrin.

Actions and Uses.—It is intended for internal and hypodermic use in the treatment of cancer.

Dosage.—Internally 4 to 8 Cc. (1 to 2 fluidrams) three times daily. Hypodermically 0.3 Cc. (5 minims) every other day, gradually increased, depending on the patient. This dose should be diluted with two or three volumes of sterile normal salt solution, using aseptic precautions and employing some local anesthetic.

Manufactured by Armour & Co., Chicago.

HOLADIN—Extractum Pancreaticum Integrum.—An extract of the entire pancreas containing all the constituents of the gland and exhibiting great potency in respect to the several known enzymes, trypsin, amylopsin, lipase and the milk-curdling ferment.

Holadin is a grayish-white powder, slightly aromatized, somewhat hygroscopic, freely but not wholly soluble in water.

Tests.—The tryptic power is tested as follows: 0.10 Gm. is placed in a flask, mixed by agitation with 25 Cc. of tepid water containing 0.20 Gm. sodium bicarbonate; at once 100 Cc. of milk at 40° C. is added, and then the flask kept in a water bath at 40° C. From time to time small portions are withdrawn in a beaker glass, when the addition of a few drops of dilute acetic acid will show a constant diminution in the volume and character of the curd until finally only minute, flocculent coagula are observed. Holadin should not remain in contact with sodium bicarbonate for more than a brief interval before adding the milk, as its enzymic power is rapidly decreased thereby.

To test for the fat splitting action, 0.10 Gm. of holadin is mixed with 25 Cc. of water and 100 Cc. of milk and maintained at 40° C. In about 15 minutes the presence of fatty acids can be detected by odor and taste and confirmed by chemical tests.

The action of the milk-curdling ferment is shown in the following way: 0.02 Gm. holadin is mixed with 10 Cc. water in a beaker and then 100 Cc. fresh milk, previously warmed to 40° C., poured on, with sufficient stirring to mix thoroughly, and the mixture digested, without agitation, in a water bath at 40° C. In a few minutes the milk will begin to show the characteristic evidences of curdling similar to that produced by the milk-curdling ferment of the gastric juice. When the milk, however, has acquired a semi-solid, jelly-like consistency, if it then be stirred constantly with a glass rod, the curd will break down, become diffusible and in time disappear, a behavior which is in marked contrast to the action of the milk-curdling ferment of the gastric juice which causes the formation of a firm curd, easily separable from the whey.

The starch-converting power is determined as follows: Triturate 15 Gm. of arrowroot or potato starch with 500 Cc. of distilled water, boil for 10 minutes, allow to cool, and make up to 500 Cc. with distilled water. Prepare an iodin test solution by diluting 0.5 Cc. of Liquor Iodi Compositus, U. S. P., with water to make 500 Cc. and have ready sufficient number of tubes containing an equal quantity of this solution.

Triturate 0.130 Gm. holadin in a perfectly dry mortar with 1.170 Gm. of lactose. Place 100 Gm. of the starch mucilage in a Florence flask in a water bath at 40° C. and mark "A"; place in the water bath also another flask of the same content and mark "B." Add to flask "A" 0.20 Gm. of the holadin triturate; to flask "B" add 0.05 Gm. of the holadin triturate; maintain both flasks in the water bath at 40° C. At the expiration of ten minutes withdraw from flask "A" one drop of the solution and add to one of the tubes of the iodine solution, when no coloration will occur. At the end of fifty minutes take one drop from flask "B" and add to one of the tubes of iodine solution, and at intervals of a few minutes repeat this; in about sixty minutes, no coloration, or at the most a very faint coloration, will appear. Under these circumstances, one grain of holadin will convert 135 grains of starch completely in ten minutes, and 600 grains in about sixty minutes.

Actions and Uses.—Holadin has power to digest starch and proteids and to split fats. It is claimed to be useful in various diseases in which digestion of food is imperfect.

Dosage.—Holadin is furnished only in capsules, each capsule containing approximately three grains. One capsule should be given about three hours after meals and one capsule at bedtime. The dose can be gradually increased to two or three capsules at a time.

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark No. 60,623.

Holadin and Bile Salts, Fairchild.—This preparation is a mixture of Holadin 5 parts with Bile Salts, Fairchild (which see) 1 part, put up in 3 grain capsules, containing holadin approximately 0.15 Gm. (2½ grains), and bile salts 0.03 Gm. (½ grain).

Dosage.—One capsule about three hours after meals and one capsule at bedtime.

PANASE.—Panase is a combination of the digestive enzymes of the pancreas derived from the pancreatic gland of the pig.

It is prepared by macerating the gland and extracting the enzymes together with a small amount of the proteid matter of the gland.

Panase is a light, yellowish white powder having a slight odor and somewhat mucilaginous taste. It is not entirely soluble in water or glycerin, owing to the small amount of protein present. Filtration of its solution, however, does not impair its digestive activity.

It is incompatible with strong alcohol, acids, alkalies, and other substances which destroy the activity of ferments.

Panase should possess the diastatic, proteolytic, milk curdling, and fat splitting properties of the pancreatic juice. It converts 200 times its weight of hydrous starch to loss of blue iodine reaction in ten minutes when tested according to the method of Biome (Pharm. Rev., 1906, vol. 24, p. 260). According to the method adopted by the Council it converts 113 parts of anhydrous starch to the colorless end point in ten minutes (JOURNAL A. M. A., July 11, 1908, p. 140; Jour. Am. Chem. Soc., May, 1908, p. 798). For the methods of testing for the different enzymes see Pancreatic Preparations.

Actions and Uses.—Panase is intended to be used in cases in which it is believed that the enzymes of the pancreas are deficient or in which it is desired to hasten the digestion of starch.

Dosage.—0.13 Gm. (2 grains) or more.

Manufactured by Frederick Stearns & Co., Detroit, Mich.

Panase Essence.—Essentia Panasi. A mixture containing in each 100 Cc., 4 Gm. of panase in a menstruum containing 14 per cent. of alcohol and 12.5 per cent. of glycerin with small amount of flavoring matter and sugar. Dose 4 Cc. (1 fluidram) containing 0.16 Gm. (2¾ grains) of panase.

Panase Tablets.—Each tablet contains panase, 0.13 Gm. (2 grains).

TRYPSIN-Armour.—Trypsin is the proteolytic ferment of the pancreas.

Trypsin-Armour is prepared from the fresh pancreas of hogs with the view of retaining the proteolytic ferment in an especially active condition. It has been activated by enterokinase.

It is a light yellow powder, possessing a faint odor and a mentlike taste. It is not completely soluble in water at once, but dissolves almost entirely in time. It is insoluble in alcohol and ether. Free acids (in more than traces), pepsin and large amounts of alkalies are incompatible. Solutions of trypsin should not be exposed to a temperature above 40.6° C. (105° F.).

The proteolytic power of trypsin is determined by digesting 10 grams of fresh moist blood fibrin in 50 Cc. of solution of sodium carbonate, 0.4 per cent., to which has been added 0.150 to 0.300 Gm. of the trypsin powder, maintaining the mixture at 40° C. (104° F.) for one hour, and shaking by rotation every ten minutes. The fibrin used is washed free from blood with cold water and then chopped, using an Enterprise meat chopper with plate having 5/64 inch perforations. The hashed fibrin is pressed lightly in a cloth, mixed, and is then ready for use. The residue left after one hour's digestion is compared with the amount left by employing a standard sample of trypsin powder under exactly the same conditions at the same time.

Actions and Uses.—Trypsin has the power of digesting proteid materials; it acts best at 40° C. (104° F.) and in a slightly alkaline medium.

When applied locally in solutions made slightly alkaline by sodium carbonate, it dissolves diphtheritic and other false

membranes. It is claimed to have the power of destroying the cells of cancer without acting on the healthy tissue. These claims, however, are not generally accepted.

Dosage.—Trypsin is applied locally by means of a brush or as a spray. About 0.4 Gm. (6 grains) are mixed with 0.13 Gm. (2 grains) sodium bicarbonate and triturated in a mortar while adding 1 or 2 drams of distilled water, then warmed to 38° to 40.6° C. (100° to 105° F.) and applied immediately. The application may be repeated several times an hour if necessary, a fresh solution being made before each application. The internal dose is 0.13 Gm. (2 grains) or more three times daily. It should not be used for hypodermic injection.

Manufactured by Armour & Co., Chicago.

Milk Curdling Ferments.

PEGNIN—Milk Sugar Rennet.—The milk-curdling enzyme of calf's rennet, diluted with sugar of milk and sodium chloride.

Pegnin is prepared by mixing pure rennin with milk sugar and sodium chloride.

It is a fine white powder, having a sweet, saline taste, readily soluble in water, and forming a solution which readily and rapidly coagulates the casein of milk.

On adding 2 Gm. of pegnin to 200 Gm. of milk, which has been boiled and cooled to 40° C. (104° F.), and shaking the mixture, the milk should be completely coagulated in from 3 to 4 minutes, and after vigorously shaking the curd should be finely divided and equally distributed throughout the liquid. A solution of 1 Gm. of pegnin in 50 Cc. of water should require 17 to 17.5 Cc. of tenth-normal silver nitrate for complete precipitation, equivalent to 10 per cent. sodium chloride.

It is incompatible with a temperature higher than that indicated for the fermentative action.

Actions and Uses.—Producing a finely divided coagulum, it obviates the formation of the clotty curds which are liable to be produced when untreated cow's milk is taken as food. Cow's milk coagulated with pegnin as described below has been used for infant feeding and as a food for adults in stomach affections and in disturbances of the digestion incident to infectious diseases, in hyperacidity, etc.

Dosage.—8 to 10 Gm. (120 to 150 grains) of pegnin are required for 1 liter (34 fluidounces) of milk previously boiled and cooled to about 40° C. (104° F.). The mixture, after brief shaking, is allowed to stand 2 to 3 minutes, or until it is completely coagulated, and then shaken vigorously during several minutes until the coagulum has been converted into a smooth, homogeneous mixture, and set aside in a cool place. For infants it is transferred to the nursing bottle as required and heated in warm water to the body temperature (37.5° C., 99.5° F.) before feeding.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 700,631 (May 20, 1902; expires 1919).

Peptic Preparations.

ELIXIR OF ENZYMES.—Elixir of enzymes is a solution containing pepsin and rennet in a menstruum containing 20 per cent. of alcohol.

Elixir of enzymes is a light yellow, palatable, liquid preparation. One part digests about 20 parts of coagulated egg albumin in 2½ hours. Eight Cc. (2 fluidrams) coagulate 500 Cc. (one pint) of milk in a few minutes.

Actions and Uses.—It is claimed to be useful as an aid to digestion and as a vehicle for various drugs.

Dosage.—1 to 8 Cc. (1 to 2 fluidrams) with meals; children in proportion.

Manufactured by Armour & Co., Chicago.

ENZYMOL.—Enzymol is a glycerin-aqueous acid extract prepared directly from the mucous membrane of the fresh animal stomach, free from alcohol, but containing a trace of thymol and having an acidity due to combined hydrochloric acid equivalent to 0.26 to 0.3 per cent. of actual hydrochloric acid. It contains no free hydrochloric acid, but does contain a slight excess of protein over that combined with the acid. It is adjusted to a definite proteolytic power and contains 25 per cent. of glycerin by weight

Enzymol is a light straw-colored fluid.

The presence of proteins is shown by coagulation by heat or by the addition of alcohol. The proteolytic power when acidified and tested by the method of the U. S. P. for pepsin should be such that 4 Cc. will dissolve 800 Gm. of coagulated egg-albumin in two and one-half hours.

Action and Uses.—When applied to morbid tissues enzymol is said to have the power of dissolving them by its proteolytic action even without the addition of acid. It is said to dissolve necrotic bone, by virtue of the combined acid which it contains. Its physiologic action is said to cease in contact with living tissue.

Enzymol is said to be useful as an application to purulent and necrotic surfaces for the removal of the morbid materials.

Dosage.—It is made ready for use by the addition of one half to one or two volumes of water; for the solution of necrotic and carious bone it may be applied undiluted.

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark No. 44,769.

ESSENCE OF PEPSIN-Fairchild.—A solution of the milk-curdling and proteolytic ferments of the gastric glands in a menstruum containing 18.5 per cent. of alcohol by volume.

The solution is prepared by direct extraction from the peptic glands of the stomach.

One Cc. will curdle 250 Cc. of milk at 38° C. in a few minutes, and dissolve 50 Gm. of coagulated egg albumin when tested according to the directions of the United States Pharmacopeia.

Actions and Uses.—Essence of pepsin has the action of rennin and of pepsin and is recommended by the manufacturers for preparing milk and in cases in which pepsin is indicated.

Dosage.—4 Cc. (1 fluidram) or more.

Manufactured by Fairchild Bros. & Foster, New York.

DIGITALIS PREPARATIONS

The chemistry of digitalis is very imperfectly understood, but several principles have been isolated in a greater or less degree of purity. These include digitalin, digitalein, digitoxin, digitonin and digitin. The term digitalin, unfortunately, is applied in a loose way to all of these principles, and in a more restricted sense to indicate digitalinum verum, or true digitalin, which is probably a definite substance.

Digitalinum purum, or German digitalin, is a mixture of several glucosides, consisting of 50-60 per cent. of digitonin and only 5-6 per cent. of true digitalin. German digitalin is the preparation usually found on the market and is ordinarily dispensed when "digitalin" is prescribed.

French Digitalin, or Homolle's digitalin, is also a mixture of several glucosides, but consists mainly of true digitalin.

Merck's crystallized digitalin is neither digitalin nor digitoxin, but digitonin or digitin, Merck using the three terms, crystallized digitalin, digitonin and digitin as synonyms.

Digitaline crystallisée of Nativelle is not digitalin, but is nearly identical with digitoxin.

It must be remembered, therefore, that Merck's "crystallized" digitalin, Merck's "pure" digitalin and the "true" digitalin of Boehringer and Sons, which naturally might be supposed to be identical, are *different in their action.*

DIGALEN—Liquor Digitoxini Solubilis.—Digalen is a mixture said to contain 1 part of Digitoxinum soluble Cloetta,[1] in 1,000 parts of glycerin and 1,600 parts distilled water with 7.5 per cent. of alcohol. 1 Cc. is said to contain 0.0003 Gm. of Digitoxinum Solubile Cloetta.

Digitoxinum solubile Cloetta is manufactured as follows:

The dried and finely powdered leaves of digitalis are extracted with dilute alcohol; then the extract is mixed with lead acetate solution in order to remove chlorophyll and resins, and filtered. From this filtrate the excess of lead is precipitated with sodium sulphate and the alcohol distilled off in vacuo. From the remaining aqueous solution the substance is extracted by ethereal solvents and precipitated afterward in an amorphous and pure condition according to a special secret method.

Digalen is a colorless or slightly yellowish fluid of an agreeable aromatic smell and a sweet taste which turns bitter afterward.

Digitoxinum soluble Cloetta is described as an amorphous, white or slightly yellow powder. Its solubility is said to be about five times as great as that of crystallized digitoxin. It is said to dissolve very readily in alcohol and chloroform and a little less readily in ether. It has an intensely bitter taste and causes violent sneezing. It is claimed to be the form in which digitoxin exists in the digitalis leaf before it is deposited in a crystalline and insoluble form.

In order to test for the active principle in digalen, a few drops of dilute acetic acid are added to 2 Cc. of digalen solution and then the mixture is shaken out with chloroform. This solution is evaporated and the residue dissolved in about 2 Cc. of glacial acetic acid containing traces of iron chloride. If to this solution

1. The Council has not determined whether digalen contains "soluble amorphous digitoxin" or not, but accepts it merely as a standardized soluble and fairly stable digitalis preparation.

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concentrated sulphuric acid is added cautiously without mixing, so as to form a separate layer at the bottom of the test tube, a small brown ring will form between the two layers, which becomes broader in the course of some hours and expands toward the top of the tube in a blue-green to black shade, and toward the bottom of it in a reddish-brown one, while the acetic acid acquires finally a dark green-blue color.

Actions and Uses.—The same as Digitoxin.

(See Jour. A. M. A., May 8, 1909, p. 1499.)

NOTE.—Under certain conditions which have not yet been determined satisfactorily, digalen sometimes deteriorates, even when the bottle remains unopened.

Dosage.—Average single dose 1 Cc. (16 min.) Maximum single dose 2 Cc. (32 min.). Maximum daily dose 6 Cc. (96 min.). Intravenous injections of 1 Cc. (16 min.) may be repeated at intervals of one-half to one hour as necessary. For protracted dosage from 1 to 2 doses daily of from 7 to 14 drops are given.

Manufactured by F. Hoffmann-LaRoche & Co., Basel, Switzerland (The Hoffmann-LaRoche Chemical Works, New York). U. S. trademark No. 43,593.

DIGIPURATUM.—Digipuratum is a digitalis preparation said to contain digitoxin and digitalin in the form of tannates. It is standardized biologically by the method of Gottlieb. It is claimed that 85 per cent. of the inactive substances found in the ordinary extract have been removed and that it is free from digitonin.

Digipuratum is obtained by removing objectionable constituents from an alcoholic extract of digitalis, neutralized with alkaline hydroxides, by the addition of ether, petroleum benzene, or other suitable precipitant, and reducing the purified liquid to a powder, by evaporation with milk sugar.

Digipuratum is a greenish yellow, odorless powder of bitter taste. The active constituents of digipuratum are insoluble in cold water and diluted acids, but are easily soluble in weak alkalies.

Digipuratum responds to the following identity test: If 0.1 Gm. digipuratum is underlaid with about 3. Cc. of glacial acetic acid which contains 1 per cent. of a 5 per cent. solution of ferric sulphate, there appears a red band (presence of digitalin) and above this another, at first bright green, later changing to dark green and finally blue (presence of digitoxin).

To determine the digitoxin content, 10 Gm. of digipuratum are dissolved with moderate heat in 50 Cc. of water; 5 Cc. of 10 per cent. ammonia water are added and the liquid is then extracted with chloroform. The chloroformic extractions are filtered into a tared vessel and the chloroform removed by distillation. The residue is dissolved in 3 Gm. of chloroform and mixed with 7 Gm. of ether and 50 Gm. of petroleum ether. The separated flakes are collected on a small filter. Then the residue on the filter is dissolved in absolute alcohol, allowing the solution to run into the tared distilling vessel. The alcohol is then distilled off and the residue dried to constant weight. The digitoxin thus found should not amount to more than 0.04 Gm.

The physiologic activity is determined by the method of Gottlieb: 1 Gm. of digipuratum is treated with 19 Cc. of hot water and 1 Cc. of a 2 per cent. solution of sodium bicarbonate. If now 0.15 Cc., 0.2 Cc., and 0.25 Cc., respectively, of this solution is injected into the femoral lymphatics of freshly caught land frogs (Rana temporaria), weighing 30 Gm. each, the exposed heart of the animals should permanently be brought to a stop in the majority of instances (say in five out of six experiments) within half an hour after the administration of a 0.2 Cc. dose. If 0.2 Cc. of the 5 per cent. solution=0.01 Gm. of digipuratum, is sufficient to stop the systolic heart-beat within half an hour, then 1 Gm. of digipuratum will contain 100 units; should 0.25 Cc. of the 5 per cent. solution be necessary, the number of units of digipuratum it contains would be 80; if 0.25 Cc. should not yet prove sufficient, the preparation would be found to be ineffective; and should the systole be arrested after a dose of 0.15 Cc. within half an hour after injection, the preparation would be too strong.

The total physiologic activity having been determined, the relative amount that is due to digitoxin can be determined by using the digitoxin separated in the above quantitative determination and by the difference between this amount and the total physiologic activity the amount due to the digitalin alone can be estimated.

Actions and Uses.—The same as digitalis, but it is claimed that it is less liable to disturb the stomach and on account of its exact dosage cumulative effects can be more easily avoided than with other preparations of digitalis.

Dosage.—The same as digitalis.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. U. S. patent No. 943,578 (Dec. 14, 1909; expires 1926). U. S. trademark No. 73,012.

Digipuratum Tablets, 1 1-2 grains.—Each tablet is said to contain digipuratum 0.1 Gm. (1 1/2 grains).

DIGITALEIN CRUDE.—Digitaleinum Crudum.—Digitalein crude is a mixture of glucosides from digitalis purpurea prepared according to the process of Schmiedeberg, containing digitoxin, digitalin and digitalein.

Commercial digitalein is an amorphous, yellowish-white, bitter powder, soluble in water and absolute alcohol, insoluble in chloroform and ether. The aqueous solution foams on shaking. The solution yields a precipitate on addition of lead acetate, ammonia water or tannic acid.

Actions and Uses.—Digitalein acts on the heart like digitalis. It is a diuretic.

Its uses are the same as those of digitalis.

Dosage.—0.001 to 0.002 Gm. (1/60 to 1/30 grain) two or three times a day.

DIGITALIN, TRUE—Digitalinum verum Kiliani.—Schmiedeberg's digitalin. Digitalin, true, is a glucoside, $C_{36}H_{56}O_{14}$, found in the seeds and leaves of digitalis purpurea and derived commercially from German digitalin.

To a solution of one part German digitalin in four parts of 95 per cent. alcohol, five parts of ether by weight (Sp. Gr. 0.720) are added and the mixture allowed to stand in a closed vessel for twenty-four hours. In the clear supernatant solution the quantity of dissolved substance is estimated and the whole then subjected to a vacuum distillation until its weight becomes 1.6 times that of the total dissolved substance. To this concentrated solution water, in an amount 2.4 times the weight of dissolved substance, is added, forming a solution containing approximately 20 per cent. alcohol, from which crude digitalin gradually separates on standing. The crude product is washed first with 10 per cent. alcohol and then with water, and finally dried at a moderate temperature. Further purification is effected by boiling the alcoholic solution with animal charcoal. (Kiliani's method. Hager's Handb. der Pharm. Praxis, Vol. 1, p. 1030.)

Digitalin occurs as a white amorphous powder, or in characteristic, granular masses. It melts at 217° C. (412.6° F.) and becomes yellow. It is soluble in 1,000 parts of water and in 100 parts of 50 per cent. alcohol at the ordinary temperature; easily soluble in strong hot alcohol, but nearly insoluble in ether and chloroform. Digitalin dissolved in alcohol and treated with very dilute acid and heat yields digitaligenin and two sugars.

With concentrated sulphuric acid digitalin forms a golden yellow solution which on the addition of potassium hypobromite solution changes to a magnificent rose red or violet red.

If a little digitalin is dissolved in 3 to 4 Cc. of glacial acetic acid to which a trace of ferric chloride solution has been added and the mixture carefully underlaid with concentrated sulphuric acid (Keller's reaction) a deep carmine red band appears; the lower layer of the acetic acid is light yellow changing to brownish. (Difference from digitoxin.)

Sulphuric acid containing a little ferric sulphate gives with a little digitalin at first an intense golden yellow color, and then a red solution; this color rapidly changes to a beautiful and permanent violet. If too much digitalin is used the red color remains and only the surface layer becomes violet.

On heating on platinum foil digitalin should burn without leaving a weighable residue.

If a granule of digitalin is covered with 2 Cc. of 10 per cent. potassium hydroxide solution no color should develop within one minute (absence of other glucosides).

If digitalin is stirred to a thin paste with water and for every 100 parts of water used 22 parts of amyl alcohol is added with shaking, and the mixture set aside in a closed vessel for 24 hours, the presence of digitonin will be indicated by the formation of distinct masses of crystals.

Action and Uses.—The same as those of digitalis. Its cumulative action is probably not so great as that of digitoxin.

Dosage.—It is impossible at present to state the correct dose for digitalinum verum Kiliani. Some authorities give the same dose as that for digitoxin, whereas others give it as much larger. It is best given in pills made by trituration with sugar of milk and massing with glucose. Solutions of digitalin rapidly lose their strength and should be freshly prepared.

DIGITALIN, "FRENCH."—Homolle's Digitalin. Digitaline Amorphe. Digitaline Chloroformique. Digitalin, French, is a mixture obtained from Digitalis purpurea by the method of Homolle, consisting mainly of digitalinum verum, Kiliani.

100 Gm. powdered digitalis leaves are moistened with one liter of water and slowly exhausted in a percolator until the percolate amounts to three liters. This is precipitated with 250 parts of lead acetate and the filtrate from the precipitate treated with 40 parts of crystallized sodium carbonate and 20 parts of sodium ammonium phosphate, in order to remove the excess of lead. The filtrate is precipitated with 40 parts of tannic acid. The tannate is mixed with 25 parts of powdered litharge and 50 parts of purified animal charcoal and dried. From the dried mass the digitalis bodies are extracted with 90 per cent. alcohol, the latter is distilled off and the residue washed with distilled water and again taken up in 90 per cent. alcohol. This is again distilled and the residue exhausted with chloroffrm. On expelling the latter the digitalin remains behind (Hager's Pharm. Praxis, Vol. 1, p. 1035).

French digitalin is a yellowish-white, amorphous powder of a peculiar aromatic odor and little taste. It is neutral to litmus, almost insoluble in water, soluble in alcohol and chloroform and insoluble in ether. It softens at 90° C. and begins to melt at 100° C. It is not precipitated by solutions of lead salts, but with tannic acid it forms a tannate insoluble in water. It is colored emerald green by concentrated sulphuric acid.

Concentrated sulphuric acid dissolves digitalin French, producing a yellow color, which finally goes over to an emerald-green color.

Action and Uses.—Action like that of digitoxin. Uses the same as those of digitalis.

Dosage.—What has been said with regard to the dose of digitalinum verum, applies to the French digitalin: the dose

is variously given as 0.00025-0.002 Gm. (1/250 to 1/35 grain). Maximum daily dose 0.006 Gm. (1/10 grain). It must be used with caution and its action carefully watched.

DIGITALIN, GERMAN—Digitanilum Germanicum.—Digitalin, German, is a mixture of glucosides obtained from digitalis seeds according to the process of Walz, and consisting largely of digitonin, with digitalin verum and other glucosides.

Digitalis seeds are extracted with alcohol, the alcohol driven off, the extract diluted with water and purified by precipitation with lead acetate. The filtrate is freed from lead by sodium phosphate. From the liquid thus purified the digitalis bodies are precipitated with tannic acid, the tannate well washed with water and decomposed with lead or zinc acetate. The digitalin thus separated is taken up in alcohol, the latter carefully distilled off and the residue washed with ether as long as it takes up anything. The digitalin purified in this way is dried at a low temperature and finally powdered. (Hager's Handbuch der Pharm. Praxis, 1903, Vol. I, p. 1032.)

German digitalin is a yellowish-white, amorphous powder, soluble in water and alcohol, insoluble in ether and chloroform. It is said to contain about 50-60 per cent. of digitonin and 5-6 per cent. of digitalinum verum, the remainder being digitalein and other glucosides.

Sulphuric acid containing a trace of ferric sulphate produces with digitalin, German, an intense golden-yellow coloration, changing to red and finally to a permanent reddish-violet.

Action and Uses.—Similar to those of digitalis.

Dosage.—0.001 to 0.002 Gm. (1/60 to 1/30 grain). Maximum dose 0.004 Gm. (1/16 grain): maximum per day, 0.02 Gm. (⅓ grain). Doses of from 1/10 to ⅓ grain, and even higher, have been used by some clinicians.

As German digitalin (so-called digitalinum purum) is a mixture of very powerful active principles, the proportion of which may vary with changes in the manipulations, it is very important that the directions for its preparation should be very carefully followed, and caution should be exercised to purchase only such products as the manufacturers can guarantee to have been made with the necessary care.

DIGITONIN.[1]—Digitonin is a glucoside $C_{27}H_{44}O_{14} + 5H_2O$ derived from the seeds of digitalis purpurea and belonging to the saponins.

Digitonin is separated from German digitalinum purum by the addition of ether to the alcoholic solution (see digitalin). The precipitate is dissolved in 10 parts of 85 per cent. alcohol and the solution put into water at 45° C. After standing from six to eight hours the greater part of the digitonin will crystallize out.

Digitonin crystallizes in colorless needles or thick warty masses which dissolve in 600 parts of cold water and 50 parts of warm water to a turbid solution, but dissolves to a clear solution in 50 parts of 50 per cent. alcohol. Its solutions are levorotatory. When heated in alcoholic solution with hydrochloric acid it is split into dextrose, galactose and digitogenin.

Concentrated sulphuric acid dissolves it with a red color which is intensified by the addition of a drop of bromine water.

Concentrated hydrochloric acid dissolves digitonin without color, but the solutions become yellow and finally reddish violet on heating or on long standing.

Keller's reaction gives a rose red zone which soon fades.

Action and Uses.—Digitonin acts as a heart depressant when introduced into the circulation, but it is not absorbed from the alimentary canal, and therefore exerts no action on the circulation when taken by the mouth, but it renders digitoxin more soluble whether in infusion or when the leaf is taken by the mouth.

DIGITOXIN—Digitoxinum.—Digitoxinum (Pharm. Helvetica, edit. 4). Digitaline Crystallinée (Pharm. Française, 1908). Digitoxin, $C_{34}H_{54}O_{11}$ is the chief active principle of digitalis, having the character of a glucoside.

The leaves of Digitalis purpurea having been extracted with water and dried, are extracted with 50 per cent. alcohol. This solution is treated with lead acetate, forming a precipitate, which is allowed to settle. The supernatant liquid is decanted. The remaining alcohol is evaporated *in vacuo* and the residue repeatedly extracted with ether. The ether extract is then shaken out with water and concentrated by distillation and the residue recrystallized from hot alcohol (85 per cent.) and decolorized by boiling with animal-charcoal (Schmidt's Pharm. Chemie, 3d edit., Vol. II, p. 1640).

Depending on the solvent from which it is crystallized, it is either hydrated on anhydrous. The hydrated form is obtained when crystallized from alcohol and the anhydrous from chloroform and alcohol mixture, forming colorless rectangular leaflets melting at 243° C. (470° F.) (Pharm. Française, 1908). The anhydrous preparation is official in the Pharm. Française, 1908.

It is insoluble in water, benzin or carbon disulphide, slightly soluble in ether and easily soluble in chloroform. At 15° C. it is soluble in 79.80 parts of absolute alcohol and in 43.04 parts of 90 per cent. alcohol. It is slightly soluble in fatty oils (Pharm. Française, 1908).

Digotoxin dissolved in 2 Cc. glacial acetic acid containing a trace of ferric chloride when poured onto 2 Cc. of concentrated sulphuric acid containing a trace of ferric chloride, will produce a brown color at the zone of contact of the two solutions. This color gradually changes to green and finally an indigo blue; after one-half hour the entire acetic acid layer will become blue. (Pharm. Française, 1908).

It dissolves to a colorless solution in cold concentrated hydrochloric acid, but when this solution is heated on the water bath for some time a green color is obtained. Concentrated sulphuric acid dissolves it, producing a green color.

It should not lose weight appreciably when heated to 100° C. It should be insoluble in water and in benzin, but completely soluble in chloroform. It should leave no residue when ignited (Pharm. Française, 1908).

Action and Uses.—Digitoxin acts much like digitalis. Its activity varies with the method of preparation. Digitoxin from an unknown source should be tested on animals before it is used on patients. Owing to its slow excretion, it is cumulative in action when too frequently repeated. Locally it is very irritant, and when given by mouth is liable to derange the digestion. Penzoldt claims that gastric irritation may be avoided by giving it only when the stomach is full. Owing to its irritant action it is not suitable for hypodermic injection.

Dosage.—Single dose 0.00025 (1/250 grain); maximum daily dose 0.0010 Gm. (1/67 grain). It should be given largely diluted and repeated cautiously.

Antidotes: Emetics, tannin, nitroglycerin, morphine, alcoholic stimulants or camphor.

DOLOMOL.—Dolomol is magnesium stearate, $Mg(C_nH_mO_x)_2$, containing small amounts of magnesium palmitate and oleate.

It is a white powder, insoluble in water, unctuous to the touch, nearly odorless and tasteless. It is claimed to be practically free from oleate. Its magnesium content corresponds to nearly 7 per cent. MgO.

Actions, Uses and Dosage.—Acting as a protective to the skin, Dolomol is employed in cutaneous affections as a dusting powder, alone or mixed with various remedies.

The following dolomol compounds are listed: Dolomol-Acetanilid, 25 per cent.; Dolomol-Acid Boric, 20 per cent.; Dolomol-Acid Carbolic, 5 per cent.; Dolomol-Acid Picric, 25 per cent.; Dolomol-Acid Pyrogallic, 5 per cent.; Dolomol-Acid Salicylic, 5 per cent.; Dolomol-Acid Salicylic, 10 per cent.; Dolomol-Acid Tannic, 10 per cent.; Dolomol-Alum, 10 per cent.; Dolomol-Aristol, 10 per cent.; Dolomol-Balsam Peru, 10 per cent.; Dolomol-Bismuth Subgallate, 25 per cent.; Dolomol-Calendula, 25 per cent.; Dolomol-Calomel, 25 per cent.; Dolomol-Camphor, 10 per cent.; Dolomol-Chrysarobin, 5 per cent; Dolomol-Europhen, 10 per cent.; Dolomol-Guaiacol, 5 per cent.; Dolomol-Ichthyol, 10 per cent.; Dolomol-Iodoform Deodorant, 10 per cent.; Dolomol-Menthol, 5 per cent.; Dolomol-Naphthol, 5 per cent.; Dolomol-Oil of Cade, 10 per cent.; Dolomol-Resorcin, 10 per cent.; Dolomol-Salol, 10 per cent.; Dolomol-Sulphur Sub., 25 per cent.; Dolomol-Tar, 10 per cent; Dolomol-Thymol, 2 per cent.

Manufactured by Pulvola Chemical Co., New York. Not patented or trademarked.

EMETINE HYDROCHLORIDE—Emetinæ Hydrochloridum.—Methyl-cephaeline. Emetine hydrochloride is the hydrochloride, $C_{28}H_{42}N_2O_5.HCl.3H_2O$, of a base found together with cephaeline in Cephaelis Ipecacuanha.

Emetine hydrochloride occurs as a white crystalline powder, soluble in water and alcohol. A freshly prepared concentrated solution of ammonium molybdate in concentrated sulphuric acid is colored brown by emetine; this color changes to violet when a drop of concentrated hydrochloric acid is added. The general alkaloidal reagents precipitate emetine, even from dilute solutions. Alkalies precipitate emetine from aqueous solutions of its salts.

Actions and Uses.—Emetine acts similarly to Ipecac but is relatively more nauseant and less emetic, and causes relatively less renal irritation, but more cardiac depression.

Dosage.—Expectorant, 0.005-0.01 Gm. (1/12-1/6 grain). 0.01-0.02 Gm. (1/6-1/3 grain) causes emesis, but cephaeline is preferred as an emetic.

EMPYROFORM.—Empyroform is a condensation of birch tar and formaldehyde.

According to the patent specifications birch tar is boiled with formaldehyde solution and the hot liquid poured into hydrochloric acid. When cold, the solid mass is collected and washed until free from acid.

It is a grayish-brown, almost odorless powder, insoluble in water, but soluble in acetone and chloroform.

Actions and Uses.—Empyroform is an antipruritic, sedative and desiccant. It is said to be superior to tar and free from

1. Crystallized digitalin—Merck.

irritant or toxic effects. See note under Creosote Carbonate.

It is claimed to be useful in all stages of eczema, psoriasis, lichen, urticaria, prurigo, pityriasis, etc.

Dosage.—It is applied as a 5 to 10 per cent. ointment, 10 to 20 per cent. zinc paste, 10 to 20 per cent. tincture, and 37.5 per cent. suspension.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 761,260 (May 31, 1904; expires 1921). U. S. trademark No. 43,419.

EPICARIN.—Oxynaphthyl-Ortho-Oxytoluic Acid.—Epicarin, $C_6H_3(OH)(COOH)(CH_2C_{10}H_6OH)2:3:1 = C_{18}H_{14}O_4$, is β-naphthol-hydroxy-toluic acid.

It is obtained by the action of chlormethyl-salicylic acid on a solution of *b*-naphthol, in glacial acetic acid, thus:

$$C_6H_3(OH)(COOH)(CH_2Cl + C_{10}H_7OH =$$
$$C_6H_3(OH)(COOH)(CH_2C_{10}H_6OH) + HCl$$

It forms colorless or yellowish needles, melting at 190° to 195° C. (380° to 389° F.) difficultly soluble in water, but easily soluble in alcohol, ether, acetone, and in soaps. It dissolves in oils on the addition of a little ether. It has the character of a strong acid, forming well crystallized salts, which, however, are sparingly soluble in water, particularly the sodium salt. On exposure to air it acquires a reddish color due to oxidation; if it is then recrystallized from glacial acetic acid, colorless crystals are again obtained which melt at 166° C. (338° F.). These, however, retain a little acetic acid, but lose this by heating at 120° C. (248° F.).

The alcoholic solution of epicarin produces an intense blue color with ferric chloride. When heated with concentrated sulphuric acid, a red-brown solution, having a vivid green fluorescence, is produced. If shaken with chloroform and solution of potassium hydroxide, a yellowish color, changing later to yellowish green, is developed, thus distinguishing epicarin from *b*-naphthol, which produces a deep blue color under the same conditions.

Being a strong acid, it is incompatible with alkaline hydroxides or carbonate, especially those of sodium, with which it forms an almost insoluble salt. It should not be exposed to the air, which colors it red.

Actions and Uses.—Epicarin is a non-poisonous antiseptic and parasiticide. Administered internally, it is excreted mostly undecomposed. It is said to be useful in the treatment of skin diseases, particularly scabies, tinea tonsurans, prurigo and certain forms of eczema. (See note under Creosote Carbonate.)

Dosage.—It is used only externally in the form of a 5 to 20 per cent. ointment, with petrolatum or wool fat (lanolin) as base, or in the form of oily or alcoholic solutions (10 per cent).

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 671,622 (April 9, 1901; expires 1918).

EPINEPHRINE PREPARATIONS

EPINEPHRINE.—Epinephrine is 1, 2-dihydroxy-4¹-methyl-amino ethyl-4¹-ol benzene, $C_6H_3(OH)_2(CHOH.CH_2NHCH_3)$, a substance with feeble basic properties, obtained from the suprarenal gland of the sheep or other animal.

Epinephrine is a finely crystalline white or yellowish powder, odorless and slightly bitter. It melts at 201 to 207° C. (401 to 404° F.), turning brown and decomposing at the higher temperature.

The alkaloid shows a slightly alkaline reaction to moistened red litmus paper. It is almost insoluble in cold water, more readily in hot water. It is difficultly soluble in alcohol and insoluble in ether. The colorless aqueous solution of the alkaloid is easily oxidized on contact with the air, becoming pink, then red, and eventually brown. The base reacts with acids to form salts which are readily soluble in water; it is also soluble in the fixed alkalies, but not in ammonium hydroxide or in solutions of the alkaline carbonates. The following reactions are the most characteristic: The addition of ferric chloride to a solution of the alkaloid produces a beautiful emerald green color which by careful addition of caustic alkali becomes purple, and then carmine red. Strong acid prevents the reaction with ferric chloride, limiting the change of color to a dirty yellowish-green. It gives a vivid pink color with iodine. The alkaloid reduces silver salts and gold chloride very energetically, and the liquid turns red. A drop of 1:10,000 solution instilled into the eye will, within a few seconds, produce a pallor of the conjunctiva.

Its incompatibilities are the same as those of other alkaloids. Its solutions should be kept tightly stoppered and protected from the light.

Actions and Uses.—Epinephrine acts peripherally on a variety of structures, probably by stimulating the sympathetic nerve endings. Its most important therapeutic actions consist in a constriction of the blood vessels, with consequent high rise of blood pressure; a stimulation of the vagus center with slowing of the heart, and a direct stimulant and tonic effect on the heart muscle, similar to digitalis. Large doses also cause glycosuria. Continued administration of large doses leads to atheroma. The effect of a single dose is very fleeting. It is not irritant. The effects are seen on local application and intravenous and intramuscular injection. When given to animals, by mouth or hypodermically, moderate doses have almost no action.

Dilute watery solutions rapidly lose their strength, the deterioration being accompanied by a reddish or brownish discoloration.

The alkaloid is used mainly locally for its vasoconstrictor action, in hemorrhage, and in catarrhal and congestive conditions. It is said to cut short the asthmatic paroxysm (being used by spraying the larynx and by hypodermic injections). Intravenous injections are effective in shock and anesthesia accidents (care being taken not to give an overdose). It has also been recommended in heart disease, Addison's disease, etc., but opinions are divided as to the benefits to be expected from oral administration.

The vasoconstrictor action of epinephrine is used to intensify and prolong the anesthetic effect of local anesthetics by retarding the circulation in the affected part and thus hindering the dilution of the anesthetic agent by too rapid absorption into the general blood stream.

Dosage.—0.3 to 2.0 Cc. (5 to 30 minims) of a 1:1,000 solution every two or three hours. Hypodermically, 0.06 to 1 Cc. (1 to 15 minims) of a 1:1,000 solution, diluted with sterile water. Locally it is used in solution varying in strength from 1:15,000 to 1:1,000, for ordinary applications, in oily solution for sprays, in ointment for application to mucous membranes, such as the eye or the nose, where a slower but more lasting action is desired and in suppositories. Since the alkaloid is insoluble, solutions in water should be made of some salt, but for the oily solutions the alkaloid itself should be employed.

Proprietary Preparations:

ADNEPHRIN.—The name used for epinephrine by F. Stearns & Co., Detroit, Mich.

Adnephrin Emollient.—An ointment composed of adnephrin and a neutral base (1:1,000).

Adnephrin Oil Spray.—A 1:1,000 solution of adnephrin in a neutral oil, aromatized.

Adnephrin Solution.—A sterile solution (1:1,000 of adnephrin in physiologic salt solution containing one-half of 1 per cent. of methaform (chlorbutanol). A small proportion of sodium sulphite is added to the extraction of the glands.

Adnephrin Suppositories.—Each suppository represents a 1 to 1,000 combination of adnephrin with oil of theobroma and weighs about 1 Gm. (15 grains).

ADRENALIN.—The name used for epinephrine by Parke, Davis & Co., Detroit, Mich. It is prepared by the method of Takamine.

For Tests, Incompatibilities, Actions and Uses see Epinephrine. U. S. patents Nos. 730,175, 730,176, 730,196, 730,197, 730,198 (June 2, 1903; expires 1920); 753,177 (Feb. 23, 1904; expires 1921). U. S. trademark.

Adrenalin Chloride Solution.—A 1:1,000 solution of adrenalin hydrochloride in physiologic salt solution, preserved by the addition of 0.5 per cent. of chloretone (chlorbutanol).

Adrenalin Inhalant.—A neutral oily solution containing adrenalin chloride 1:1,000, 3 per cent. of chloretone, 13 per cent. of alcohol, and aromatics.

Adrenalin Ointment.—One part of adrenalin chloride in 1,000 parts of oleaginous ointment base.

Adrenalin and Chloretone Ointment.—Contains 0.1 per cent. of adrenalin chloride, and 5 per cent. of chloretone in an ointment base of hydrous wool fat and petrolatum.

Adrenalin Suppositories.—1 part of adrenalin to 1,000 parts of oil of theobroma (cacao butter). Each suppository weighs about 1 Gm. (15 grains).

Adrenalin Tablets.—Each tablet contains 0.001 Gm. (3/200 grain) adrenalin, as borate, yielding a 1:1,000 solution when dissolved in 15 minims (1 Cc.) of water.

Adrenalin and Cocaine Tablets.—Each hypodermic tablet contains cocaine hydrochloride 0.01 Gm. (1/6 grain), and adrenalin, as borate, 0.0002 Gm. (1/300 grain).

ADRIN.—The name (word mark) used for epinephrine by H. K. Mulford Co., Philadelphia. It is prepared by the method of von Fuerth (Zeit. f. physiol. chem., vol. 26, p. 18). It is not marketed in its pure form. All the preparations contain boric acid.

U. S. trademark No. 41,916.

Adrin Compound Vaginoids.—Vaginal Suppositories of Epinephrine Compound, Mulford. Each suppository contains adrin 0.00065 Gm. (1/100 grain), ichthyol 0.13 Cc. (2 minims), phenol 0.13 Gm. (2 grains), zinc phenolsulphonate 0.08 Gm. (1¼ grains) in a boroglyceride and gelatin base and weighs about 7.63 Gm. (118 grains).

Adrin Inhalant Comp.—Epinephrine Inhalant Comp., Mulford. —Each 100 Cc. contains epinephrine (as hydrochloride), 0.1 Gm. (7/16 of a grain in a fluidounce), camphor, 0.3 Gm. (1 1/3 grains in a fluidounce), menthol 0.22 Gm. (1 grain in a fluidounce), thymol, 0.043 Gm. (1/5 of a grain in a fluidounce), oil of eucalyptus, 0.22 Gm. (1 minim in a fluidounce), and hydrastine, 0.0053 Gm. (1/40 of a grain in a fluidounce), oil of wintergreen, 0.99 (4.5 minims in a fluidounce). The solvent is a mixture of castor and cotton seed oils, together with 10 per cent. absolute alcohol by volume.

Adrin Troches.—Troches of Epinephrine—Mulford—each troche contains epinephrine, 0.000693 Gm. (1/700 grain), menthol, 0.0013 Gm. (1/50 grain), benzoic acid, 0.0027 Gm. (1/25 grain), oil of gaultheria, 0.0034 Gm. (1/20 grain), and eucalyptol, 0.0013 Gm. (1/50 grain). The base is sugar with a small amount powdered acacia.

Adrin Ointment.—Ointment of Epinephrine, Mulford. An ointment containing 0.1 per cent. each of adrin and boric acid in a base of petrolatum and anhydrous wool fat, flavored with oils of wintergreen and eucalyptus.

Adrin Solution 1:500.—Solution of Epinephrine, 1:500, Mulford. A solution of adrin, 1 to 500, in normal salt solution, containing boric acid, 0.25 per cent., and also small quantities of sulphite and chloroform.

Adrin Suppositories.—Suppositories of Epinephrine, Mulford. Each suppository contains adrin 0.0027 Gm. 1/25 grain) and oil of theobroma, 1.23 Gm. (19 grains).

Adrin Tablets, 1/65 grain.—Tablets of epinephrine, 1/65 grain, Mulford. Each tablet contains adrin, 0.001 Gm. (1/65 grain); sodium chloride, 0.007 Gm. (1/10 grain); boric acid, 0.002 Gm. (1/33 grain). A 1:1,000 solution is prepared by dissolving a tablet in 1 Cc. (16 minims) of water. The tablets can be used hypodermically.

Adrin Tablets, Hypodermic, 1/100 grain.—Tablets of Epinephrine, hypodermic, 1/100 grain, Mulford. Each tablet contains adrin 0.00065 Gm. (1/100 grain) and represents 0.6 Cc. (10 minims) of the 1:1,000 solution.

Adrin Tablets, Hypodermic, 1/200 grain.—Tablets of Epinephrine, 1/200 grain, Mulford. Each tablet contains adrin 0.00033 Gm. (1/200 grain) and represents 0.3 Cc. (5 minims) of the 1:1000 solution.

Adrin and Cocaine Tablets. Tablets of Epinephrine and Cocaine, Mulford. (For dental practice). Each tablet contains adrin, 0.00065 Gm. (1/100 grain) and cocaine hydrochloride, 0.016 Gm. (¼ grain).

Adrin and Sparteine Tablets, Hypodermic.—Tablets of Epinephrine and Sparteine, Hypodermic, Mulford. Each tablet contains adrin 0.00033 Gm. (1/200 grain) and sparteine sulphate, 0.008 Gm. (⅛ grain).

SUPRACAPSULIN.—The name used for epinephrine by The Cullahy Packing Co., South Omaha, Neb.

Not patented. U. S. trademark No. 72,580.

Supracapsulin Solution.—A solution 1:1,000 of supracapsulin in normal salt solution with small quantity of sulphite and 0.5 per cent. of chloral.

Supracapsulin Inhalant.—A solution 1:1,000 of supracapsulin in an aromatized neutral oil, containing approximately 2.5 per cent. of chloral and 10 per cent. of alcohol.

SUPRARENALIN.—The name used for epinephrine by Armour & Co., Chicago.

An organic base is used for the the final precipitation.

U. S. patent No. 829,220 (Aug. 21, 1906; expires 1923).

Suprarenalin Inhalant.—A 1:1,000 solution of suprarenalin in an aromatized oil, containing approximately 10 per cent. of alcohol.

Suprarenalin Ointment.—An ointment containing 0.1 per cent. of suprarenalin, dissolved in a petrolatum base.

Suprarenalin Solution.—A 1:1,000 solution of suprarenalin sulphite in normal saline solution, free from other preservatives.

Suprarenalin Triturates.—Triturates composed of suprarenalin, milk sugar, and boric acid, in such proportion that each 0.03 Gm. (½ grain) triturate dissolved in 15 minims of water, yields a 1:1,000 solution.

L-SUPRARENIN SYNTHETIC.—L-suprarenin synthetic is epinephrine produced synthetically according to the method of Stolz & Flaecher (Ztschr. f. physiol. Chem., 58, p. 189).

L-suprarenin synthetic is a white odorless powder nearly insoluble in water, alcohol and ether. It melts at 211°-212°. It has the power of rotating polarized light to the left:—

$$[a]\frac{19.6°}{D} = -51.4°$$

L-suprarenin synthetic has the chemical and physical properties and physiologic effect of natural epinephrine obtained from suprarenal glands.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York.) German patent No. 222,451.

L-SUPRARENIN SYNTHETIC BITARTRATE.—L-suprarenin synthetic bitartrate is the acid tartrate of l-suprarenin synthetic.

It is a white odorless powder readily soluble in water yielding an acid solution. It melts at 149° and rotates polarized light to the left.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York). German patent No. 222,451.

SUPRARENAL LIQUID—Liquor Suprarenalis (P. D. & Co.).—Suprarenal liquid is an aqueous extract of suprarenal glands, preserved with 0.8 per cent. of chlorbutanol (chloretone). Each Cc. (16 minims) of the solution represents 1 Gm. (15.4 grains) of the fresh glands.

Dosage.—**The preparation is used undiluted for spraying, especially for mucous membranes.**

Prepared by Parke, Davis & Co., Detroit, Mich.

ERGOTININE CITRATE—Ergotininæ Citras.—The citrate of ergotinine, a crystalline alkaloid, probably $C_{35}H_{39}O_5N_5$, (Barger and Carr) derived from ergot.

Ergotinine is obtained by extracting the residue left on evaporation of an alcoholic tincture of ergot with light petroleum to remove oily matter, dissolving the residue in ethyl acetate and shaking with citric acid solution. Sodium bromide or hydrobromic acid is then added and the precipitated hydrobromides of the alkaloids, ergotinine and ergotoxin are collected. The mixed hydrobromides are dissolved in caustic soda and shaken with ether; in this way ergotinine is removed first. Finally, the ergotinine is crystallized from alcohol, leaving ergotoxine and impurities in the mother liquor. By interaction of ergotinine with citric acid, ergotinine citrate is obtained.

Ergotinine citrate is a grayish-white, amorphous powder, slowly soluble in water; it has an acid reaction to litmus paper.

Ergotinine crystallizes in long needles, the sides of which are not quite parallel, which darken and melt at temperatures from 219° to 229° C. One part of ergotinine dissolves at 18° in 292 parts of alcohol, 1,020 parts of absolute ether, in 91 parts of ethyl acetate, and is moderately soluble in acetone and benzene, and readily soluble in chloroform. It is insoluble in light petroleum and in water. Its specific rotation in alcoholic solution saturated in the cold is + 338°. It forms salts which produce colloidal solutions in water which are precipitated by electrolytes so that they are little soluble in the presence of the stronger mineral acids.

Tests: Ergotinine citrate when carefully decomposed by alkali, the mixture extracted with ether and the ether evaporated yields a residue which responds to the test for ergotinine. Solutions of ergotine have a bluish violet fluorescence, especially when acidified. Concentrated sulphuric acid colors the alkaloid at first yellow, after some hours violet and at length blue. If a small quantity of ergotinine is dissolved in concentrated sulphuric acid and a trace of ferric chloride added, the mixture takes on an orange red coloration, which soon passes into red while the edges of the liquid are colored blue or bluish green.

If a few milligrams of ergotinine are dissolved in about 4 Cc. of glacial acetic acid a trace of ferric chloride added and the mixture underlaid with concentrated sulphuric acid a beautiful violet color appears at the junction of the two liquids.

Actions and Uses.—**According to the investigations of Barger and Dale, ergotinine has very slight physiologic activity when it enters the system unchanged, but it is liable to be converted to a certain extent into ergotoxine, which possesses marked physiologic activity and appears to represent the pharmacologic actions of ergot. The action of ergotinine when given per os or when injected hypodermically, is variable in intensity but represents the action of ergot.**

Ergotinine citrate can be used as a substitute for ergot, and is said to act efficiently, when injected hypodermically, in the treatment of headaches and of uterine hemorrhage. Combined with strychnine it is said to be useful as a stimulant in uterine hemorrhage.

Dosage.—.00032 to .00064 Gm. (1/200 to 1/100 grain), hypodermically.

Proprietary Preparations:

TABLOID ERGOTININE CITRATE—Tabloid Ergotininæ Citratis.—Each tablet contains ergotinine citrate 0.00032 Gm. (1/200 grain).

Dosage.—One or two, hypodermically.

Prepared by Burroughs, Wellcome & Co., London, England, and New York. U. S. trademark on "Tabloid" Nos. 11,993, 43,563, 43,559, 43,569, 44,219.

TABLOID ERGOTININE CITRATE AND STRYCHNINE SULPHATE.—Tabloid Ergotininæ Citratis et Strychninæ Sulphatis.—Each tablet contains ergotinine citrate 0.00065 Gm. (1/100 grain) and strychnine sulphate 0.0032 Gm. (1/20 grain).

Dosage.—One or two, hypodermically.

Prepared by Burroughs, Wellcome & Co., London, England, and New York. U. S. trademark, as for Tabloid Ergotinine Citrate.

EXTRACT OF ERGOT, PURIFIED — Extractum Ergotæ Purificatum.—Ergotin Bonjean. Extractum secalis cornuti (Pharm. Helvetica, edit. 4); Extractum ergoti (Pharm. Française, 1908). Purified extract of ergot is an aqueous extract of ergot purified by alcohol.

Powdered ergot is extracted by percolation with water and the percolate concentrated, diluted with alcohol, allowed to stand, then filtered and the filtrate evaporated to a soft extract.

It is reddish brown, of characteristic odor and taste, soluble in water and in a mixture of equal parts of water and alcohol. The aqueous solution is yellowish brown and acid in reaction (Pharm. Helvetica, edit. 4).

If 2 Cc. of an aqueous solution (1:20) is mixed with 7 Cc. of water and 1 Cc. Mayer's reagent there should appear at most but slight turbidity; the turbidity is increased by the addition of a trace of hydrochloric acid; the further addition of 5 drops of dilute acid produces within a few minutes a flocculent precipitate.

10 Cc. of a 1:20 solution of purified extract of ergot should become turbid upon the addition of 1 Cc. picric acid solution and precipitation should occur within five minutes.

If a solution of 0.2 Gm. purified extract of ergot in 5 Cc. water is made alkaline with 1 to 2 drops of ammonia water and then shaken out with ether, the ether extract evaporated and the residue dissolved in 2 Cc. acetic acid to which a trace of ferric chloride has been added and the mixture carefully poured upon concentrated sulphuric acid, a bluish violet color appears at the zone of contact (Pharm. Helvetica, edit. 4).

Action and Uses.—Purified extract of ergot has the action and uses of ergot.

Dosage.—0.2 to 0.5 Gm. (3 to 8 grains).

This preparation should not be confused with the following:

Ergotin Wernich (Pure Dried) is a purified and dialyzed dried aqueous extract of ergot.

Ergotin Wernich (Liquid) is a dialyzed extract of ergot, in the form of a reddish brown liquid.

Ergotin Wernich (Soft) is a purified and dialyzed soft extract of ergot; a reddish brown syrupy liquid.

Ergotin Wiggers (Pure Dried) is a dried, alcohol purified extract of ergot.

Ergotin Yvon is a fluidextract of ergot prepared by extracting with dilute solution of tartaric acid.

ERYTHROL TETRANITRATE.—Tetranitrol.—Erythrol tetranitrate, $C_4H_6(NO_3)_4 = C_4H_6O_{12}N_4$, is the tetranitrate of erythrite (butane-tetrol) $C_4H_6(OH)_4$.

It is obtained by the nitration of the tetratomic alcohol erythrite.

It forms colorless crystalline scales, insoluble in cold water, readily soluble in alcohol, melting at 61° C. (141.8° F.). On percussion it expodes much like nitroglycerin.

Actions and Uses.—It is a vasodilator and antispasmodic, like nitroglycerin. Its action is slower and more lasting; it begins in 15 minutes and persists for three or four hours.

It is said to be useful in angina pectoris and vascular diseases. It is reported as especially useful as a prophylactic in preventing anginal pain.

Dosage.—0.03 to 0.06 Gm. (½ to 1 grain) every four to six hours. Because of its explosiveness it is best dispensed in tablets.

Proprietary Preparations:

ERYTHROL TETRANITRATE TABLETS, Merck. Each tablet contains erythrol tetranitrate 0.03 Gm. (½ grain).

Prepared by E. Merck, Darmstart, Germany (Merck & Co., New York). German patent No. 81,664.

ETHYL AMINOBENZOATE.—Aethylis Amino-Benzoas.— Paramidobenzoic Acid Ethyl Ester.—Ethyl aminobenzoate, $C_6H_4NH_2COO(C_2H_5)$ 1:4, is the ethyl ester of paraminobenzoic acid, $C_6H_4NH_2COOH$, 1:4.

Paranitrobenzoic acid is obtained by the oxidation of paranitrotoluene, and this may be ethylized by the action of sulphuric acid and alcohol and the ester so obtained reduced to paramidobenzoic acid ethyl ester by the action of zinc and hydrochloric acid, or the acid may first be reduced and subsequently converted into the ethyl ester.

It is a white, crystalline powder, easily reduced to impalpability, melting at 90° to 91° C. (194° to 195.8° F.); odorless and tasteless, but producing a sensation of numbness when placed on the tongue; almost insoluble in cold and difficultly soluble in hot water; soluble in six parts of alcohol, in ether, benzene and to the amount of 2 to 3 per cent. in fatty oils. In oil solutions it may be sterilized without decomposition, but by prolonged boiling or by warming with dilute alkalies it is split up into alcohol and paramidobenzoic acid.

It should form clear, colorless and neutral solutions in alcohol or ether; after acidification with nitric acid it should not give a precipitate with silver nitrate. Its solution in dilute hydrochloric acid (1 to 10) is not affected by hydrogen sulphide. If a few drops of sodium nitrate solution be added to the slightly acidulated aqueous solution followed by some alkaline betanaphthol solution, a cherry red coloration of bluish shade is produced, which changes to orange on further addition of hydrochloric acid. It is decomposed by prolonged heating with water and is incompatible with alkalies and their carbonates.

Action and Uses.—It was introduced as a substitute for cocaine and is a local anesthetic, similar in its action to orthoform and said to be equally effective, but free from irritant action and toxicity. The anesthetic action, like that of the related compound orthoform, resembles that of cocaine, but is purely local, does not penetrate the mucous membranes, and in consequence of its insolubility the compound cannot be used by hypodermic injection. In consequence of its insolubility the anesthetic effect is more prolonged than that of cocaine.

It is said to be useful in various forms of gastralgia, in ulcer and cancer of the stomach for the relief of pain, and is applied locally in rhinologic and laryngeal affections, urethritis, etc.; it is also employed for anesthetizing wounded surfaces, burns, ulcerations and painful affections of the skin. It is more effective in cases where the skin is broken.

Dosage.—Internally, 0.3 to 0.5 Gm. (5 to 8 grains), in pastilles. Externally it is applied as a dusting powder, either pure or diluted. It may be applied in ointment or in the form of suppositories.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). German patents Nos. K 19,416 Onm.

ETHYL BROMIDE—Aethylis Bromidum.—Aether Bromatus (Pharm. Germanica, edit. 4; Pharm. Belgica, edit. 4; Pharm. Helvetica, edit. 4). Aethylium bromatum (Pharm. Française, 1908).

Ethyl bromide, C_2H_5Br, is the hydrobromic acid ester of ethyl alcohol, containing approximately 1 per cent. ethyl alcohol.

Ethyl bromide is a colorless, strongly refractive, easily volatile liquid, having a pleasant ethereal odor. It is insoluble in water, but readily soluble in alcohol and in ether. It boils at from 38° to 40° C. (101° to 104° F.). Its specific gravity at 15° is 1.453 to 1.457 (Pharm. Germanica).

It is stable when pure, but when contaminated with ethyl iodide it becomes colored when exposed to light. It burns with difficulty. It is very difficultly saponified by potassium hydroxide and it is not attacked by sulphuric or nitric acids. Silver nitrate gradually precipitates silver bromide (Pharm. Française, 1908). If a mixture of 1 Cc. ethyl bromide, 5 Cc. alcohol and 10 drops of (15 per cent.) sodium hydroxide solution is heated to boiling, cooled, acidified with dilute sulphuric acid, then shaken with chloroform and chlorine water added a brown coloration will be produced in the chloroform layer. If equal volumes of ethyl bromide and sulphuric acid are shaken together in a bottle previously rinsed with sulphuric acid and closed with a glass stopper, the acid should not be colored yellow within an hour. After shaking equal volumes of ethyl bromide and water, no change of volume should occur in the two liquids, the water separated from the ethyl bromide should not have an acid reaction nor should it become turbid immediately on the addition of a drop of silver nitrate solution (Pharm. Helvetica).

When a small portion is evaporated from a porcelain plate by causing it to flow to and fro over the surface little or no foreign odor is yielded as the last portions pass off, and the plate is covered with a slight deposit of moisture.

1 Cc. of ethyl bromide mixed with 3 drops of anilin and 2 Cc. of alcoholic solution of potassium hydroxide should not give off the odor of isonitrile even after warming. (Absense of chloroform) (Pharm., Belgica.)

About 1 Gm. of ethyl bromide accurately weighed added to 30 Cc. of 80 per cent. alcohol containing 2 Gm. silver nitrate will precipitate, after several hours, silver bromide, which when washed and dried should weigh 1.72 Gm. for each Gm. ethyl bromide used (Pharm. Française).

Action and Uses.—Ethyl bromide is a rapid anesthetic, acting much like chloroform. The anesthesia is quickly and pleasantly induced and the recovery is rapid, but subsequently the patient may have general mild depression. Pain is abolished before consciousness. The respiration is paralyzed at about the same time as the reflexes, so that the zone of safety is very narrow. Tetanic spasms have occurred. Deaths were formerly attributed to impurities, but several have occurred when a pure article was given. It has been recommended for short operations in obstetrics, gynecology and minor surgery, but is not to be used for long operations. It must be regarded as a very dangerous agent in inexperienced hands.

Dosage.—3 Cc. to 12 Cc. (45 minims to 3 fluidrams) is sufficient to induce anesthesia. It should be administered rapidly with little or no air. The administration requires from 20 to 40 seconds; the anesthesia lasts about two minutes. The dose for children should not exceed 1 Cc. per year of age.

It should be protected from the light and a bottle once opened should be used at once, as it deteriorates rapidly. (To be preserved carefully in small, opaque bottle containing not more than 50 Cc. Pharm. Helvetica, edit. 4.) It should not be confounded with ethylene bromide, which is said to be very poisonous. The Sp. Gr. of ethylene bromide is 2.179, while that of ethly bromide is about 1.45

ETHYL CARBAMATE

Ethyl Carbamate is official in the United States Pharmacopeia. For description see the Pharmacopeia or the Physician's Manual of the Pharmacopeia and National Formulary.

URETHANE.—A name applied to Æthylis Carbamas, U. S. P.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

URETHAN-Hoechst.—A name applied to Aethylis Carbamas, U. S. P.

Manufactured by Farbwerke, vorm. Meister Lucius & Bruening, Hoechst a. M., Germany (Victor Koehl & Co., New York). Not patented or trademarked.

ETHYL CHLORIDE

Ethyl Chloride is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physician's Manual of the Pharmacopeia and National Formulary.

KELENE.—A name applied to Æthylis Chloridum, U. S. P., supplied in a special form of container.

Manufactured by Fries Bros., New York.

ETHYL SALICYLATE—Æthylis Salicylas.—Ethyl salicylate $C_6H_4.OH.COO(C_2H_5)=C_9H_{10}O_3$, is the salicylic acid ester of ethyl alcohol and is analogous to methyl salicylate (oil of wintergreen).

It is made by the action of salicylic acid on ethyl alcohol in the presence of sulphuric acid and subsequent purification.

It is a transparent, colorless, volatile liquid, possessing a pleasant characteristic odor and taste. Its sp. gr. is 1.184 at 20° C. (68° F.) and it boils at 231.5° C. (448.7° F.). It is insoluble in water, but soluble in alcohol.

Actions and Uses.—Ethyl salicylate has the same action as the salicylates, but is said to be less toxic.

Dosage.—3 to 6 c.c. (5 to 10 minims) 3 or 4 times a day.

Proprietary Preparation:

SAL ETHYL.—A name applied by Parke, Davis & Co., Detroit, Mich., to their preparation of ethyl salicylate, which is marketed in gelatin globules containing 0.33 Cc. (5 minims) each. U. S. trademark.

ETHYLENEDIAMINE. — Æthylendiamin — Æthylene Diamine — Ethane Diamine — α.b.Diamino-Ethane. — Ethylenediamine, is 1,2-diamino-ethane, $CH_2(NH_2).CH_2(NH_2)=C_2H_8N_2$.

It is prepared by heating 1.2-dibrom-ethane, ethylene bromide, with an excess of alcoholic ammonia, for 12 hours at 100° C. (212° F.), removing the ammonium bromide formed by filtration, evaporating the filtrate to dryness, distilling the residue with potassium hydroxide, and collecting the fraction distilling between 115° and 130° C. (239° to 266° F.) and bringing the liquid by successive purifications to a constant boiling point at 117° C. (242.6° F.).

It is a clear, colorless, thick liquid, having a sp. gr. 0.97 boiling at 117° C. (242.6° F.), without decomposition, having a strong alkaline reaction, an ammoniacal odor and a caustic taste. It is freely soluble in water, and may be mixed with cresols, but is not miscible with benzene (benzol) or ether. It dissolves albumin, even when boiled, very readily.

Being a strong base its incompatibilities are about the same as those of sodium hydroxide.

Actions and Uses.—It is said to be non-corrosive and useful as an albumin solvent for the solution of false membranes in diphtheria and similar affections of the mucous membranes. It is presented for use in the form of kresamine (which see).

Proprietary Preparation:

ETHYLENEDIAMINE SOLUTION, 10 Per Cent.—A solution containing 10 per cent. ethylenediamine (which see).

Actions and Uses.—See ethylenediamine.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York).

ETHYLENEDIAMINE PREPARATIONS

KRESAMINE.—Ethylene-Diamine Trikresol.—Kresamine is a clear watery solution of 25 per cent. of trikresol (which see) and 25 per cent. of ethylene-diamine.

It is a clear, colorless liquid, miscible in all proportions with glycerin, and soluble to the extent of about 20 per cent. in water, but insoluble in petrolatum.

Actions and Uses.—Kresamine is a bactericide, with a claimed minimum of toxicity. It is said that the bactericidal effect of the cresol and its power of penetrating the animal tissues are greatly enhanced by the presence of ethylenediamine and it is claimed to be less irritating when used as a wet dressing than other antiseptics. It is said to be useful in all cases where an active bactericide is required and particularly when microbes are in an albuminous menstruum. The preparation is not so dangerous as carbolic acid. It has been employed for the treatment of ulcers, eczema, lupus and other skin affections.

Dosage.—It is used only in dilutions (2 to 25) containing 2 per cent. or less of each of its active constituents.

Kresamine may be applied in the form of ointment.

A dilution containing 2 per cent. of each ingredient was formerly marketed under the name "Ethylene-diamine Trikresol Solution." This was used without dilution.

Prepared by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). German patent No. 74,634.

EUCAINE

The "Eucaines" are two closely allied synthetic bases, differentiated as eucaine "A" and eucaine "B," or "Alpha-eucaine" and "Beta-eucaine" alpha-eucaine being a synthetic derivative of triacetonamine, while beta-eucaine is a synthetic derivative of vinyl-diacetone-alkamine.

Alpha-Eucaine Hydrochloride has been withdrawn from the American market by the agents, Schering & Glatz, New York.

BETA - EUCAINE HYDROCHLORIDE — Beta - Eucainæ Hydrochloridum.—Trimethylbenzooxypiperidinum Hydrochloricum (Pharm. Helvetica edit. 4). Eucainum Hydrochloricum β (Pharm. Hungarica, edit. 3). Chloretum Eucaicum (Pharm. Danica, 1907). Eucaine Hydrochloride β. Beta-eucaine hydrochloride. $C_6H_7N(CH_3)_2(C_6H_5COO).HCl$, **is 2,6,6-trimethyl-4-benzoxy-piperidine hydrochloride.**

It is prepared by treating diacetonamine with paraldehyde, reducing the product with metallic sodium, benzoylating the vinyl-diacetonalkamine (melting at 138° C.) so produced by treatment with benzoylchloride, neutralizing the resulting benzoyl-vinyl-diacetonalkamine (trimethyl-benzoxypiperidin) with hydrochloric acid and crystallizing.

It forms a white crystalline powder, soluble in 20 to 30 parts of water at the ordinary temperature, but more soluble in warm water, soluble in 25 to 30 parts of alcohol, producing neutral solutions which can be sterilized by boiling without change. The aqueous solutions yield ether soluble precipitates of the free base on addition of alkali hydroxides or carbonates. Ammonia water produces a precipitate which redissolves, but is reprecipitated on the addition of more ammonia.

The saturated aqueous solution gives no precipitate with mercuric chloride, which distinguishes it from the corresponding alpha-eucaine salt. It gives no color reactions with sulphuric or nitric acid, but yields a yellow precipitate with chromic acid, orange yellow with bismuth-potassium iodide, lemon yellow with picric acid and a white precipitate with phosphomolybdic acid. It is incompatible with alkalies and their carbonates.

If to a solution of 0.1 Gm. of beta-eucaine hydrochloride in 20 Cc. of water 1 drop of ammonia water (10 per cent.) is added, a white precipitate is produced which gradually disappears on shaking. If 3 drops more or ammonia water are added, a precipitate again occurs which dissolves on the addition of 20 Cc. of water. Further addition of ammonia produces a precipitate which is again dissolved on the addition of 10 Cc. of water. If to this liquid ammonia is again added no precipitate occurs, but merely a milky turbidity which disappears on the addition of water.

Beta-eucaine hydrochloride dissolves in sulphuric acid without color.

If 1 drop of a 1 per cent. solution is mixed with 1 drop of mercuric chloride test solution, no precipitate should occur (absence of cocaine and alpha-eucaine).

0.1 Gm. of beta-eucaine hydrochloride should leave no weighable residue on incineration.

Quantitative Determination: 0.5 Gm. eucaine hydrochloride is dissolved in 100 Cc. of alcohol. This solution is titrated with tenth normal sodium hydroxide solution, using phenolphthalein as indicator. 1 Cc. tenth normal sodium hydroxide solution= 0.0269 Gm. of eucaine hydrochloride. Instead the alkaloid may be extracted with chloroform from the aqueous solution made alkaline with ammonia water, the chloroform allowed to evaporate spontaneously, the residue dried in a desiccator, and weighed. The alkaloid should weigh 86.56 per cent. of the weight of the salt.

Actions and Uses.—Beta-eucaine hydrochloride is a local anesthetic like cocaine, but weaker and devoid of the stimulating properties of the latter. It does not dilate the pupil, nor does it contract the blood vessels as does cocaine. It has the advantage of stability even on prolonged boiling. It may be used in all cases in which cocaine is indicated as a local anesthetic, especially in ophthalmology.

Dosage.—It may be applied in a 2 to 3 per cent. solution to the eye, 5 to 10 per cent. for nose and throat and 5 to 10 per cent. for ointment for hemorrhoids.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 657,880 (Sept. 11, 1900; expires 1917). German patient No. 97,672.

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BETA-EUCAINE LACTATE—Beta-Eucainæ Lactas.—Beta-eucaine lactate, $C_5H_7N(CH_3)_2(C_6H_5COO).C_3H_6O_3$, is 2,6,6-trimethyl-4-benzoxy-piperidine lactate.

It is prepared in a manner similar to the method for beta-eucaine hydrochloride, lactic acid being substituted for hydrochloric.

Beta-eucaine lactate forms a white crystalline powder soluble in about 5 parts of water at the ordinary temperature in 10 parts alcohol and in 5 parts chloroform and in fatty oils with the aid of chloroform. It melts at about 152° C. (305.6° F.). The aqueous solution is feebly alkaline to litmus. In aqueous solutions the base can be thrown down by solutions of sodium or potassium hydroxide as an oily deposit which solidifies after a time. Ammonia produces a precipitate which redissolves, but is reprecipitated on the addition of more ammonia.

Tests: The precipitate caused by 4 drops of ammonia water (10 per cent.) in a solution of 0.1 Gm. of beta-eucaine lactate in 20 Cc. of water is redissolved on the addition of 20 Cc. of water.

If a few drops of diluted sulphuric acid and 1 Cc. of potassium bichlorate solution (1:10) are added to 0.1 Gm. of eucaine lactate, heating develops an odor of acetaldehyde.

0.1 Gm. of eucaine lactate should dissolve without coloration in 1 Cc. of cold sulphuric acid (sp. gr. 1.84). 0.2 Gm. of eucaine lactate, on combustion, should leave no weighable residue.

Quantitative Determination: 0.5 Gm. eucaine lactate is dissolved in 100 Cc. of alcohol. This solution is titrated, with tenth-normal sodium hydroxide solution, using phenolphthalein as indicator. 1 Cc. tenth-normal sodium hydroxide solution = 0.0323 Gm. of eucaine lactate. Instead the alkaloid may be extracted with chloroform from the aqueous solution made alkaline with ammonia water, the chloroform allowed to evaporate spontaneously, the residue dried in a desiccator, and weighed. The alkaloid should weigh 72.30 per cent. of the weight of the salt.

Actions and Uses.—The same as those of beta-eucaine-hydrochloride, over which it possesses the advantage of greater solubility.

Dosage.—For hypodermic injections, 2 to 4 per cent. solutions (preferably in 0.6 to 1.0 per cent. sodium chloride solution with or without epinephrine); in the eye, 1 to 2 per cent. solutions; for penciling or tamponading mucous membranes, 10 to 15 per cent. solutions; for infiltration, 1 to 500 solutions with sodium chloride 0.6 to 1 per cent. and epinephrine; for painful wounds, 5 to 10 per cent. ointments with wool fat (adeps lanæ).

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 657,880 (Sept. 11, 1900; expires 1917).

EUGALLOL.—Eugallol is a solution consisting of two parts of monoacetylpyrogallol, $C_6H_3(OH)_2(CH_3COO)$, and one part of acetone.

It is prepared by treatment of pyrogallol with acetic anhydride or acetyl chloride, in the presence of a solvent and subsequent removal of the solvent by distillation. It is also obtained by other methods.

Actions and Uses.—Eugallol acts as an energetic substitute for pyrogallol, but is liable to produce local irritation when applied to the skin.

It is said to be useful externally in old and persistent cases of psoriasis.

Dosage.—It is applied pure by penciling once a day, covering the painted part with powdered zinc oxide, suspending the application a few days if it is followed by irritation.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. German patent No. 104,663.

EUMYDRIN — Methylatropinæ Nitras. — Atropinmethyl Nitrate.—Eumydrin, $C_6H_5(HO.CH_2)CH.CO_2.C_8H_{13}N(CH_3)_2NO_3 = C_{17}H_{23}O_4N_2$, is the nitrate of methylated atropine.

It is obtained by the interaction of methyl-atropine halide with metallic nitrates, or by treatment of the methyl atropine base with nitric acid, by interaction of atropin with methyl nitrate and by other patented processes.

It is a white, crystalline salt, melting at 163° C. (325.4° F.), odorless, permanent and readily soluble in water or alcohol, but very sparingly soluble in ether or chloroform. A quantity of 100 parts contains atropin equivalent to about 90 parts of atropine sulphate.

On warming 0.01 Gm. of eumydrin with 1.5 Cc. of sulphuric acid until the solution begins to darken, and at once adding, carefully, 2 Cc. of water a violet color develops and at the same time a faint peculiar aromatic odor appears. A solution of 0.05 Gm. of eumydrin in 3 Cc. of water, remains clear on the addition of either 1 Cc. of sodium hydroxide solution or of ammonia water.

Being an alkaloidal salt it is incompatible with alkaline solutions, etc.

Actions and Uses.—Eumydrin is a mydriatic and antihidrotic, replacing atropine sulphate both internally and externally in corresponding doses. It is claimed that it dilates the pupil more rapidly than atropine and the dilatation is of shorter duration—being intermediate in these respects between atropine and homatropine. It is said to be much less toxic than atropine, so that larger doses may be given to secure the effect. It is said to be particularly useful for the treatment of night sweats, whooping cough and for the relief of enuresis.

Dosage.—Internally as an antihidrotic, 0.001 to 0.0025 Gm. (1/60 to 1/24 grain). Externally as mydriatic, in solutions about one-tenth stronger than the usual atropine solutions.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). German patent Nos. 137,622 and 138,443.

EUPHORIN—Æthylis Phenylcarbamas.—Phenyl Urethane—Phenylethylurethane—Phenylcarbamic Acid Ethyl Ester.—Euphorin, $CO(NH.C_6H_5)(OC_2H_5) = C_9H_{11}O_2N$, is a compound closely allied to Æthylis Carbamas, U. S. P. (urethane) and differing from this by the replacement of the group NH_2 by NHC_6H_5.

It is prepared by the action of aniline on chloroformic acid ethyl ester.

It forms colorless needles or a white powder, melting at 50°-51° C. (122° to 123.8° F.), having a faint aromatic odor and clove-like taste. It is almost insoluble in water, readily soluble in diluted alcohol, in alcohol and in ether.

Actions and Uses.—Euphorin is anodyne, antipyretic and antiseptic.

It is said to be useful in rheumatism, sciatica, headache, etc. Externally it is recommended to be applied as a dusting powder in venereal and skin diseases, ulcers, burns, etc.

Dosage.—0.5 to 1 Gm. (8 to 15 grains) dissolved in wine or suspended in water; externally in powder, in lanolin ointment and in superfatted soap.

Manufactured by Fabrik von Heyden, Radebeul near Dresden, Germany. U. S. Trademark.

EUPHTHALMIN—Euphthalmine Hydrochloride—Phenylglycolyl-Methyl-Vinyl Diacetonalkamine Hydrochloride.—Euphthalmin, is 1,2,6,6-tetramethyl-4-mandeloxy-piperidine hydrochloride, $C_5H_7N(CH_3)_2(C_6H_5.CHOH.COO).HCl$. It is closely related to trimethyl-benzoxy-piperidine hydrochloride (see Beta Eucaine Hydrochloride).

It is prepared by methylating vinyldiacetonalkamine (obtained as explained under beta-eucaine), treating the methylvinyldiacetonalkamine produced with a weak solution of mandelic acid (phenylglycollic acid) dissolving the base (euphthalmine) so obtained in ether, passing gaseous hydrochloric acid into the solution, and crystallizing the salt from its ether solution.

Actions and Uses.—Euphthalmin produces prompt mydriasis free from anesthetic action, pain, corneal irritation, or rise in intraocular tension. It has little or no effect on accommodation, and this disappears more rapidly than with atropine, cocaine, homatropine, etc. In its effects on the general system, euphthalmine very closely resembles atropine.

It is useful as an aid in ophthalmoscopic examinations in place of atropine, homatropine, etc.

Dosage.—2 or 3 drops of a 5 to 10 per cent. solution, according to age of the patient and the nature of the case, are instilled into the eye.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 663,754 (Dec. 11, 1900; expires 1917). U. S. trademark No. 35,541.

EUPYRINE. — Vanillin-Ethylcarbonate-Para-Phenetidin. — Eupyrine, $C_6H_4(OC_2H_5)N:[CH.C_6H_3(O.CO.OC_2H_5)(OCH_3)]$ 1:4 $= C_{19}H_{23}O_5N$ is a compound of para-phenetidin, differing from acet-phenetidine in that the acet-amino group, $NH(CH_3CO)$, is replaced by the group, $N:[CH.C_6H_3(O.CO.OC_2H_5)(OCH_3)]$.

It is prepared by the action of vanillin ethyl-carbonate, $C_6H_3(COH)O.CH_3)(O.CO.OC_2H_5)$ 1:3:4 on an equivalent amount of para-phenetidin, $C_6H_4(O.C_2H_5)(NH_2)$ 1:4. Chemically it differs from acetphenetidin (phenacetin) in that the vanillin ethyl-carbonate group has replaced the acetyl group of acetphenetidin.

It occurs in light yellow, needle-shaped crystals, melting at 87° to 88° C. (188.6° to 190.4° F.); tasteless, with faint odor of vanillin. It is insoluble in cold water, sparingly soluble in warm water and in cold alcohol, readily soluble in warm alcohol and in ether or chloroform.

Concentrated sulphuric acid is colored by eupyrine greenish yellow in the cold and dark brown on heating to the boiling point. Heated on platinum foil it burns without residue. Acids and alkalies decompose it.

Actions and Uses.—The toxic action of phenetidin is said to be counteracted in eupyrine by the vanillin. Doses twenty times as great as those used for man show no production of

an amount of methemoglobin recognizable by the spectroscope. It is claimed to be a stimulant antipyretic.

Eupyrine is claimed to be useful as an antipyretic, especially for patients with a weak stomach or otherwise sensitive, on account of its freedom from side effects. For internal use it is open to the same objections as the other coal tar derivatives (see Acetphenetidin).

Dosage.—For adults, 1.5 Gm. (23 grains) once or twice daily. It can be given by itself as a powder.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany. (C. Bischoff & Co., New York.) U. S. patent No. 658,446 (Sept. 25, 1900; expires 1917). U. S. trademark No. 39,577.

EURESOL.—Resorcin Monacetate.—Euresol is resorcinyl acetate, $C_6H_4(OH)(CH_3COO) = C_8H_8O_3$, the acetic acid ester of resorcinol, $C_6H_4(OH)_2$ 1:4.

It is obtained by acting on resorcinol with acetic anhydride or acetyl chloride, $C_6H_4(OH)_2 + CH_3COCl = C_6H_4(OH)(CH_3COO) + HCl$ or by otherwise replacing one hydroxyl group in resorcinol with an acetyl group.

It is a thick, honey-yellow, oily liquid, having an agreeable odor, boiling at 283° C. (541.4° F.) and soluble in acetone.

Actions and Uses.—Its action is similar to that of resorcinol, but milder and more lasting because of the gradual liberation of the phenol.

Euresol is said to be useful in acne, sycosis, seborrhea, and particularly in the treatment of chilblains.

Dosage.—It is applied in 5 to 20 per cent. ointments and in acetone solution.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. German patents Nos. 103,857 and 122,145.

Euresol Soap.—A soft soap, supplied in tubes, containing euresol, eucalyptol and oil of turpentine.

EUROPHEN — Di · Isobutyl · Cresol Iodide. — Europhen, $C_6H_2(C_4H_9)(CH_3)(OI).C_6H_2(CH_3)(:O)(.C_4H_9) = C_{22}H_{29}O_2I$, is a condensation product of 2 molecules of isobutylorthocresol, with 1 atom of iodine, analogous to Thymolis Iodidum, U. S. P.

It is prepared by the addition of a solution of iodine in potassium iodide to an alkaline solution of isobutylcresol, washing the precipitate with water, and drying it at a moderate temperature.

It forms a yellow, voluminous powder, fusing at 110° C. (230° F.), containing 28 per cent. of iodine, and having a faint saffron-like odor. It is insoluble in water or glycerin, but readily soluble in alcohol, ether, chloroform and the fixed oils. It is permanent in the dry state, but splits off iodine readily when moistened and rapidly when heated with water at 70° C. (158° F.), particularly in the presence of alkalies.

When triturated with glycerin and water, it yields a filtrate which is turned bluish by the addition of freshly prepared starch paste. Its alcoholic solution produces a yellow precipitate with mercuric chloride.

It should not be exposed to heat, light or damp air; it is incompatible with starch, metallic oxides, mercuric salts, and alkaline hydrates and carbonates.

Actions and Uses.—Its action is similar to that of iodoform and thymol iodide. It is claimed to be useful especially in the treatment of venereal ulcerations.

Dosage.—Europhen may be given internally in the form of pills in doses of from 0.2 to 0.3 Gm. (3 to 5 grains). Locally it may be used as a dusting powder in substance or mixed with an equal quantity of finely powdered boric acid, as an ointment, with wool fat (lanolin), or as a 5 per cent. embrocation, dissolved in olive oil.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 495,294 (expired); German patent No. 56,830. U. S. trademark No. 17,888.

EXODIN.—Exodin is a mixture of derivatives of rufigallic acid (hexahydroxy-anthraquinone). It contains diacetyl rufigallic acid tetra-methyl ester, acetyl-rufigallic acid penta-methyl ester and rufigallic acid hexa-methyl ester.

According to the patent it is obtained by treating rufigallic acid tetra-methyl ester with acetic anhydride and sodium acetate and purifying the product by crystallization.

Actions and Uses.—Exodin is claimed to be a pleasant and reliable cathartic. It is said to produce a mild and protracted tonic effect on the digestive tract and to produce neither gastric pains nor colic.

Exodin is claimed to be useful in acute and chronic constipation of the atonic form and also in cases in which regular evacuation of the bowels must be stimulated in consequence of hemorrhoids, etc.

Dosage.—For children, 0.5 Gm. (7½ grains); adults, 1 to 1.5 Gm. (15 to 22 grains) in tablets or in powder stirred up with water.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 751,216 (Feb. 2, 1904; expires 1921). U. S. trademark No. 43,029.

FERRATIN—Sodii Ferrialbuminas.—Sodium Ferrialbuminate.—Ferratin is the sodium salt of ferrialbuminic acid, containing iron in the ferric state in organic combination, equivalent to 6 per cent. metallic iron.

Sodium ferrialbuminate occurs naturally in the organs of mammals, especially in the liver. Ferratin is prepared from egg albumin and chemically pure iron salts in the presence of alkalies.

Ferratin is a light brown, tasteless powder, having a faint odor. It is soluble in weak alkaline aqueous solutions, from which solutions it is precipitated by hydrochloric acid. On dissolving 0.3 Gm. ferratin in 10 Cc. of water with the aid of a few drops of ammonia water, and then adding an equal volume of a 25 per cent. potassium carbonate solution, no precipitation occurs.

Actions and Uses.—See Organic Iron Compounds.

Dosage.—0.5 Gm. (7½ grains) three to four times daily.

Manufactured by C. F. Boehringer & Soehne, Waldhof, Mannheim, Germany. (Merck & Co., New York). U. S. patent No. 505,986 (expired). U. S. trademark No. 24,228.

FERRIC ARSENITE, SOLUBLE—Ferri Arsenis Solubilis.—Ferric Arsenite and Ammonium Citrate.—Soluble Ferric Arsenite is Ferric Arsenite made soluble by the addition of ammonium citrate.

Soluble ferric arsenite occurs in green scale, easily soluble in water; it contains 1.06 per cent. arsenic, equivalent to 1.4 per cent. arsenous oxide, and iron, equivalent to from 15 to 18 per cent. elementary iron.

Actions and Uses.—Soluble ferric arsenite is a hematinic said to be particularly indicated in anemia complicated with malaria, in pernicious anemia and in pellagra.

Dosage.—0.03 to 0.065 Gm. (½ to 1 grain). It may be given by subcutaneous injections in the gluteal region in doses of 0.03 Gm. (½ grain) dissolved in 1 Cc. (15 minims) of water every two or three days.

Non-Proprietary Preparations:

Ampules Iron Arsenite Solution S. & D.—Each ampule is said to contain soluble iron arsenite, 0.06 Gm. (1 grain), dissolved in 1 Cc. (16 minims) of distilled water, representing closely 0.00092 Gm. (1/70 grain) of arsenic trioxide and 0.0092 gm. (1/7 grain) of metallic iron.

Prepared by Sharp & Dohme, Baltimore, Md.

FERRO-MANGAN Dieterich—Liquor Ferro-Mangani Peptonati "Dieterich."—Ferro-mangan is a solution of a compound of peptone with iron and manganese, containing 0.6 per cent. of iron, 0.1 per cent. of manganese and 1.5 per cent. of peptone.

It is prepared by covering 40.0 Gm. of iron and manganese peptonate "Dieterich" with distilled water for one hour, then heating to boiling with 550.0 Cc. of distilled water and allowing to cool. An aromatic mixture is added consisting of 100.0 Cc. cognac, 75.0 Cc. alcohol, 90 per cent., 0.25 Gm. saccharin, 12.5 Cc. aromatic tinctures, and sufficient distilled water to make 1000.0 Cc.

Ferro-mangan is a clear liquid of a dark-brown color and pleasant odor and taste. It is slightly acid in reaction.

The iron is in the organic or non-ionic form (see "Organic iron preparations").

Method of Valuation: The specific gravity at 15° C. (59° F.) should be about 1.056. The percentage of dry residue at 100° C. (212° F.) varies between 13.25 and 16.80. The percentage of residue after ignition varies between 0.99 and 1.05. The percentage of iron and manganese determined by well-known methods varies between 0.58-0.64 per cent. of iron and 0.13-0.19 per cent. of manganese.

Actions and Uses.—It has the actions of iron and manganese.

It is said to be useful in anemia, chlorosis, convalescence and as a general tonic.

Dosage.—4 to 16 Cc. (1 to 4 fluidrams), according to age, three times a day.

Manufactured by Chemische Fabrik Helfenberg A. G., near Dresden, Germany (The Reinschild Chemical Co., New York). Not patented or trademarked.

FERROUS LACTATE—Ferri Lactas.—Iron Lactate—Ferrum Lacticum. (U. S. P., 1890; Pharm. Germanica, edit. 4; Pharm. Helvetica, edit. 4; Pharm. Belgica, edit. 3; Pharm Francaise, 1908); Ferrous lactate, $Fe(C_3H_5O_3)_2 + 3H_2O$ is the ferrous salt of lactic acid. The salt contains approximately 19 per cent. of metallic iron.

Ferrous lactate occurs in pale greenish-white crusts, consisting of small needle-shaped crystals, or transparent green scales, having a slight, peculiar odor and a sweetish, ferruginous taste.

It is slowly soluble in about 40 parts of cold, and in 12 parts of boiling water; almost insoluble in alcohol; freely soluble in a solution of an alkali citrate yielding a green solution.

When strongly heated the salt froths, gives out dense, white, acid fumes, chars and finally leaves a brownish red residue.

The aqueous solution of the salt has a greenish-yellow color, a slighly acid reaction, and gives a deep blue precipitate with potassium ferricyanide, and a light blue one with potassium ferrocyanide.

A 2 per cent. aqueous solution of the salt should not yield more than a faint opalescence with a solution of lead acetate (limit or absence of sulphate, chloride, citrate, tartrate and malate). The aqueous solution after acidulation with hydrochloric acid should not yield any precipitate or coloration when treated with hydrogen sulphide (absence of foreign metals).

The aqueous solution, acidulated with nitric acid, should not afford more than a slight opalescence with barium chloride solution or with silver nitrate solution (limit of sulphate or chloride). If 25 Cc. of a 2 per cent. aqueous solution of the salt be mixed with 5 Cc. of diluted sulphuric acid, the mixture boiled for a few minutes, an excess of sodium hydroxide added and the mixture filtered, the filtrate when mixed with a few drops of alkaline cupric tartrate solution and boiled, should not yield a red precipitate (absence of sugar).

If a portion of the salt be triturated with strong sulphuric acid no offensive odor should be developed (absence of butyric acid), nor should any gas be evolved (absence of carbonate), and the mixture after standing for some time should not assume a brown color (absence of sugar, gum, or other readily carbonizable impurities).

If 1 Gm. of the salt, contained in a porcelain crucible, be moistened with nitric acid and carefully ignited, it should leave a residue of ferric oxide weighing not less than 0.270 nor more than 0.278 Gm. This residue should not have an alkaline reaction on litmus paper, nor yield anything soluble to water (absence of foreign salts).

Actions and Uses.—Ferrous lactate is a mild chalybeate which because of its feeble taste may be taken without difficulty.

Dosage.—0.06 to 1.3 Gm. (1 to 20 grains). Owing to its liability to oxidation, it is best prescribed in solutions containing much sugar. Syrup dissolves 1 Gm. in 120 Gm. (4 grains to the fluidounce).

FILICIC ACID AND RELATED SUBSTANCES

Aspidium and pharmaceutical preparations thereof have long been used as teniafuges. The most recent work indicates that aspidium probably contains the following constituents, in approximately the amount indicated: Filicic acid, 3.5 per cent.; flavaspidic acid, 2.5 per cent.; albaspidin, 0.05 per cent.; aspidinol, 0.10 per cent.; flavaspidin, 0.10 per cent.; amorphous acid, 5.0 per cent. and filicic nigrine, 6.0 per cent. These substances are, for the greater part, derivatives of phloroglucinol, and some of them are ketones possessing acid characters.

The various formulas assigned to the filicic acids and the different results reported regarding their physiological activity, have given rise to much confusion, leaving the chemistry in an unsettled condition. One of the first formulas assigned to filicic acid is that of Luck—$C_{28}H_{30}O_9$, which differs considerably from the formula—$C_{14}H_{14}O_5$—given this substance by Grabowski and $C_{14}H_{16}O_5$, as suggested by Daccoma. Later two forms, a crystalline and an amorphous filicic acid, were recognized by Poulson, who suggested the formula, $C_{28}H_{40}O_{12}$ for the crystalline filicic acid and $C_{28}H_{42}O_{13}$ for the amorphous acid, which latter he considered as the active therapeutic principle of aspidium. Poulson believed the crystalline acid to be the anhydride of the amorphous acid. More recently, Gallas has stated the formula for both the crystalline and the amorphous filicic acid to be $C_{15}H_{20}O_6$. Gallas and later Kraft concluded that one form of the acid was the lactone of the other form. Filicinic acid, which has the formula ($C_6H_{10}O_3$) is sometimes confused with filicic acid. Besides a difference in the theories regarding the constitution of the various filicic acids, there has been considerable controversy over the anthelmintic properties of these substances.

Our knowledge of the subject is very imperfect, but the majority of authors still accept filicic acid as one of the active constituents of aspidium.

FILICIC ACID, AMORPHOUS.—Acidum Filicicum Amorphum.—Amorphous filicic acid is an organic acid $C_{28}H_{42}O_{12}$, obtained from several species of aspidium.

Amorphous filicic acid is a white, or yellowish powder, without odor or taste, melting at 125° C. (257° F.), soluble in cold alcohol.

Actions and Uses.—Amorphous filicic acid has been recommended as an anthelmintic, and is generally considered one of the active principles of several species of aspidium.

Dosage.—0.5-1.0 Gm. (8 to 15 grains) given with calomel or calomel and jalap.

Note:—The crystalline filicic acid, also designated as filicinic acid, which is considered as an anhydride of the amorphous, is devoid of anthelmintic action, and must not be used in place of the amorphous.

FILMARON.—Filmaron, $C_{61}H_{84}O_{18}$, is an active anthelmintic constituent obtained from the ethereal extract of aspidium (the rhizome of Dryopteris Filix Mas).

Filmaron is obtained from the male fern extract by isolating it in the form of a metallic salt, from which the free filmaron is liberated and suitably purified.

Filmaron occurs as a straw-colored amorphous powder, insoluble in water, difficultly soluble in ethyl and methyl alcohols, and rather difficultly soluble in petroleum ether. It is readily soluble in all proportions in ether, acetic ether, amyl alcohol, chloroform, benzine, carbon disulphide, and acetone, and also, though with partial decomposition, in solutions of the alkalies and alkali carbonates. The alcoholic solution exhibits a slightly acid reaction. Filmaron melts at about 60° C. (140° F.). It exhibits a strong tendency to cake together to form a resinous mass, which is difficult to reduce to powder and dispense; hence it is not marketed in substance, but as a 10 per cent. castor oil solution, which is known as "Filmaron oil."

0.5 Gm. filmaron and 5 Gm. pumice stone, and 1 Gm. magnesia are finely triturated with 250 Cc. water, the mixture shaken for half an hour, and then filtered. On passing a rapid current of carbon dioxide through the filtrate a voluminous, flocculent precipitate forms; the filtrate should afford but very slight precipitate on the addition of hydrochloric acid.

On dissolving 0.1 Gm. filmaron in 0.2 Gm. acetic ether or 0.2 Gm. carbon disulphide by rotation in a test tube, and setting the stoppered tube aside for three days, no separation should have taken place at the end of this time (absence of other male fern constituents; filicic acid and flavaspidic acid).

0.1 Gm. filmaron should completely dissolve in 0.5 Gm. warm petroleum ether, and leave no more than a slight trace of undissolved substance. To detect the filmaron in the castor oil solution (filmaron oil), dilute the filmaron oil with ether, shake out with sodium hydroxide solution, acidulate the alkaline liquid, and then take up the liberated filmaron with ether. On evaporating the ether the filmaron is obtained as a residue.

Actions and Uses.—Filmaron is said to exhibit the specific action of male fern extract and to be useful as an anthelmintic for expelling intestinal parasites.

It is claimed to be devoid of the injurious side actions sometimes exhibited by the oleoresin of male fern and to be harmless when given in the dose necessary for the expulsion of tape worm.

Dosage.—See Filmaron Oil.

Manufactured by C. F. Boehringer & Soehne, Waldhof near Mannheim, Germany (Merck & Co., New York). U. S. trademark No. 40,558.

Filmaron Oil.—Filmaron oil is a 10 per cent. solution of Filmaron in castor oil.

Dosage: 10 Cc. (2½ fluidram).

FLUORESCEIN—Fluoresceinum. — Resorcinolphthalein (a term not strictly correct but commonly used), dioxyfluoran.—Fluorescein, $O:(C_6H_3OH)_2:C.C_6H_4.COO = C_{20}H_{12}O_5$, is the anhydride of fluoresceinic acid $O:(C_6H_3OH)_2:C(OH).C_6H_4(COOH) = C_{20}H_{14}O_6$.

Fluorescein is prepared by the fusion of phthalic anhydride and resorcinol at 195-200° C. (383-392° F.) till the mass becomes solid. This is extracted with water and the residue dissolved in potassium hydroxide solution, which is then filtered and the fluorescein precipitated with acid.

Fluorescein is an orange red powder, insoluble in water, ether, chloroform, and benzol; soluble in hot glacial acetic acid and boiling alcohol. It dissolves in alkaline solutions with formations of a salt.

The alkaline solution by transmitted light is red; by reflected light it has a green fluorescence even in very dilute solutions. When fluorescein is boiled, with chalk and water, the calcium salt of fluorescein is formed which is recognized by its red brown color and green sheen.

Actions and Uses.—The soluble sodium salt of fluorescein (fluorescein 2 Gm., sodium bicarbonate 3 Gm., water to make 100 Cc.) has been used for the diagnosis of corneal lesions and detection of minute foreign bodies imbedded in the cornea. While a weak solution of fluorescein will not stain the normal cornea, ulcers or parts deprived of epithelium will become green and remain so for a time; foreign bodies will appear surrounded by a green ring; loss of substance in the conjunctiva is indicated by a yellow hue. Fluorescein also reveals defects or disease of the endothelium of the cornea, producing a deep coloration of the diseased area.

Non-Proprietary Preparation:

Tabloid (Ophthalmic) Fluorescein B.-W. & Co.—Each tablet contains fluorescin 0.00026 Gm. (1-250 grain) in combination with sodium, and weighs 0.0032 Gm. (1-20 grain).

Prepared by Burroughs-Wellcome & Co., London, England, and New York.

FORMIC ACID—Acidum Formicum.—Acidum formicum (Pharm. Helvetica, edit. 4; Pharm. Germanica, edit. 4).

Formic acid is a liquid containing 24-25 per cent. of anhydrous formic acid (HCOOH).

Formic acid is a clear colorless liquid possessing a sharp acid odor and taste. It has a specific gravity of 1.058-1.061. With lead acetate, formic acid produces a white crystalline precipitate. On warming with silver nitrate a gray turbidity and with mercuric chloride a white turbidity is produced. A solution (1-10) after the addition of a few drops of nitric acid should yield no precipitate with silver nitrate or barium chloride; and after neutralizing with ammonia water calcium chloride or hydrogen sulphide should produce no precipitate. If 1 Cc. formic acid is mixed with 5 Cc. water and 1.5 Gm. mercuric oxide (yellow) and heated on the water bath there will follow an evolution of gas leaving a mixture which when filtered will yield a filtrate which should not react acid (acetic acid). Five Cc. formic acid should quire 27.6 Cc. to 28.8 Cc. normal alkali for neutralization, denoting a content of 24-25 per cent. by weight or 254-265 Gm. anhydrous formic acid per liter. The titrated solution should yield no burned or sharp odor (Pharm. Helv. and Pharm. Germ.).

Action and Uses.—The actions resemble those of acetic acid but it is more volatile, more irritant and more antiseptic Formic acid is much more resistant to oxidation, in the body than the other organic acid, and is therefore excreted to a large extent as formates, in the urine. These have an irritant action on the kidneys and urinary tract, and are diuretic Large doses cause methemoglobinemia, but the toxicity is quite low. It has no effect on the general circulation or on the motor system, as has been claimed. It has been lauded in a great variety of disorders, but there is no good evidence that its internal use produces any benefits other than psychical Its external use as a counterirritant is rational, but it possesses no special advantages.

Dosage.—Internally, 1-20 drops of the 25 per cent. acid, largely diluted; or 0.1-0.25 Gm. (1½-4 grains) of sodium formate. Externally usually in a solution containing 1 per cent. of the absolute acid in alcohol or diluted alcohol.

FORTOIN—Methylene-Dicotoin.— Fortoin, $CH_2(C_{14}H_{11}O_4)_2 = C_{29}H_{24}O_8$, is a condensation product of cotoin and formaldehyde.

It is prepared by condensation of cotoin and formaldehyde by means of dehydrating agents (hydrogen chloride): $2C_{14}H_{12}O_4 + CH_2O = CH_2(C_{14}H_{11}O_4) + H_2O$.

Fortoin forms yellow, needle-shaped, tasteless crystals, melting at 211° to 215° C. (411.8° to 415.4° F.). It is insoluble in water, sparingly soluble in alcohol, ether or benzol, but freely soluble in dilute alkalies, acetone or chloroform.

Fortoin dissolves in cold concentrated sulphuric acid with an orange color, and on warming the solution becomes ruby red. Heated on platinum foil it should burn without leaving any residue. On shaking with cold water or alcohol it should not yield any soluble constituents.

Actions and Uses.—Fortoin has an antiputrefactive, bactericidal action. It is said to cause an active, not passive, dilatation of the intestinal vessels by which the nutrition of the epithelium is improved and its regeneration hastened.

Fortoin is said to be useful as an antidiarrheic in acute and chronic intestinal catarrh and in the obstinate diarrheas due to pellagra and to tuberculosis. (See note under Beta-naphthol Benzoate.)

Dosage.—0.25 Gm. (4 grains) three times a day for adults.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany (C. Bischoff & Co., New York). German patent No. 104,362. U. S. trademark No. 39,523.

GALLOGEN—Ellagic Acid.—Benzoaric Acid.—Gallogen, $C_6H(OH)_3$

$= C_{14}H_6O_9$ is anhydrous ellagic acid prepared from Divi-divi, the pods of *Cæsalpina coriaria*.

It is prepared by prolonged boiling of an aqueous extraction of divi-divi, whereby the amorphous acid assumes a crystalline condition and is completely precipitated, then collecting the precipitate, washing and drying.

It is a yellowish, odorless, tasteless powder, insoluble in all acid and neutral liquids, but soluble in alkaline liquids to the amount of 2 per cent., such solutions being, however, very readily oxidized.

Its solutions in alkaline media give all the reactions of tannic acid with iron salts, gelatin solution, etc. With fuming nitric acid it gives a characteristic dark red color.

It is incompatible with alkaline liquids.

Actions and Uses.—Gallogen is an astringent and antidiarrheic, slowly decomposed in the intestinal tract, thus exerting its astringent action gradually during its passage.

It is said to be useful in dysentery, cholera infantum, diarrhea, even in cases of a syphilitic or tuberculous origin.

Dosage.—0.3 to 0.5 Gm. (5 to 8 grains) for children; 0.6 to 1 Gm. (10 to 15 grains) for adults, suspended in neutral or slightly acid media.

Manufactured by Ad. Heinemann, Eberswalde, Germany (C. Bischoff & Co., New York). German patents Nos. 137,033 and 137,034.

GELSEMINE HYDROCHLORIDE—Gelseminæ Hydrochloridum.—Gelsemine hydrochloride is the hydrochloride of an alkaloid, $C_{21}H_{22}N_2O_4.HCl$ (Gerrard) ($C_{22}H_{24}N_2O_4$ by Spiegel, Ber. d. deut. Chem. Ges., vol. 26, p. 1054) derived from Gelsemium (Gelsemium sempervirens (L) Ait. f. Fam. Loganiaceæ).

Gelsemine hydrochloride occurs in prismatic crystals or a white crystalline powder. Soluble in water, but difficultly soluble in alcohol.

With concentrated sulphuric acid it gives a yellowish, and with concentrated nitric acid a green coloration. If potassium dichromate is introduced into a solution of gelsemine in strong sulphuric acid a cherry red coloration shading into violet which soon becomes green is produced at the point of contact.

Action and Uses.—Pure gelsemine appears to have a very slight toxic action, increasing reflex action in frog, to some extent, its action resembling strychnine. The effects of the commercial preparations are thought to be due to the gelseminine which they contain in varying quantities.

It has been used in neuralgia, especially trigeminal.

Dosage.—0.0005 to 0.002 Gm. (1/134 to 1/33 grain).

NOTE.—Gelseminine is a very poisonous alkaloid, found in gelsemium, which has an action very similar to that of coniine but is more depressant to the central nervous system, and must be carefully distinguished from gelsemine. Gelseminine is a mydriatic but is seldom used as such owing to its irritating action. Merck's "gelseminin" appears to consist of gelsemine and not gelseminine.

Gelsemine (Gerrard) is, according to Cushny (Proc. Am. Ph. Assn., Vol. 41, p. 850), the same as the German "crystallized gelsemine."

GLUTOL-Schleich.—Formalin Gelatin.—A chemical combination of gelatin and formaldehyde.

It is prepared by dissolving 500 Gm. of gelatin in 375 Gm. of water, adding 25 drops of formaldehyde solution, exposing the mass so obtained, in a covered box over lime, to the vapor of formaldehyde by the aid of a layer of cotton wool saturated with it until a dry mass is produced, and reducing this to powder.

It is a white, odorless powder, insoluble in water under ordinary conditions, but dissolved when heated with water under pressure, the solution thus produced gelatinizing on cooling. It is not changed by the action of acids, but is slowly decomposed in contact with living cells. It may be sterilized without decomposition.

Actions and Uses.—It is claimed that while in itself nonantiseptic, non-irritant and non-toxic, it becomes antiseptic and bactericidal in contact with living cells, in consequence of the elimination of nascent formaldehyde, which is split off very slowly but steadily.

Glutol is said to be useful as an odorless, non-irritant, non poisonous aseptic dressing, having sustained antiseptic action for wounds, ulcers, burns, etc. (See note under Creosote Carbonate.)

Dosage.—It is employed undiluted as a dusting powder, etc.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). German patent No. 104,365. U. S. patent No. 572,295 (Dec. 1, 1896; expires 1913). U. S. trademark No. 28,431.

GLYCEROPHOSPHATES.

Glycerophosphates are the salts of glycerophosphoric acid. $H_2(CH_2OH.CHOH.CH_2)PO_4$.

The calcium compound is prepared by heating glycerin and phosphoric acid under certain conditions for a considerable time and then neutralizing with lime. The precipitated calcium phosphate is removed, while the calcium glycerophosphate remains in solution From the calcium salt the other salts can be prepared by precipitating calcium by the appropriate salt of the metal whose glycerophosphate is desired. Thus the addition of sodium carbonate to a solution of calcium glycerophosphate yields insoluble calcium carbonate and a solution of sodium glycerophosphate.

The potassium and sodium glycerophosphates are dense syrupy liquids, exceedingly soluble in water, and represent 75 per cent. of the respective salts in a dry condition. The calcium, iron, lithium, magnesium and manganese glycerophosphates are pulverulent salts, moderately soluble in water.

When a solution of glycerophosphate is tested by ammonium molybdate for the presence of a phosphate, only a slight yellow precipitate should form at once.

The watery solutions of glycerophosphates decompose in a short time. They should be made from sterilized water, but hot liquids should not be used for their preparation.

Actions and Uses.—These salts were introduced as "nerve foods" and tonics on the theory that their phosphorus, being a step nearer lecithin, is assimilated more readily than that of hypophosphites. Neither the experimental nor the clinical evidence is considered conclusive by all authorities.

Dosage.—The potassium and sodium salts may be given hypodermically 0.2 to 0.25 Gm. (3 to 4 grains) in normal saline solution, or *per os* 0.25 to 0.65 Gm. (4 to 10 grains) in water or syrup. The calcium, iron, lithium, magnesium and manganese salts 0.2 to 0.65 Gm. (3 to 10 grains) doses, preferably in the form of tablets; the quinine salt in 0.1 to 0.33 Gm. (1½ to 5 grains), and the strychnine salt in 0.001 to 0.003 Gm. (1/60 to 1/20 grain) doses.

TONOLS.—The name applied by E. Schering to identify glycerophosphates of his manufacture. See appendix, Schering & Glatz.

GUAIACOL COMPOUNDS.

Guaiacol Carbonate is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physician's Manual of the United States Pharmacopeia and National Formulary.

DUOTAL.—A name applied to Guaiacolis Carbonas, U. S. P.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No 466,913 (expired). U. S. trademark.

DUOTAL-Heyden.—A name applied to Guaiacolis Carbonas, U. S. P.

Manufactured by Chemische Fabrik von Heyden, Radebeul, near Dresden, Germany (Schering & Glatz, New York). U. S. patent No. 466,913 (expired). U. S trademark No. 28,957.

BENZOSOL—Guaiacolis Benzoas.—Guaiacol Benzoate—Benzoyl-guaiacol. — Benzosol, $C_6H_4(OCH_3)(C_6H_5COO) = C_{14}H_{12}O_3$, is methoxy-benzoxy-benzene. It is closely related to guaiacol, $C_6H_4(OH)(CH_3)$, from which it differs in that the hydroxy-group is replaced by the benzoxy-group.

It is prepared by warming the potassium salt of guaiacol with benzoyl chloride and crystallizing the product from hot alcohol.

It forms colorless, minute crystals which melt at 59° to 61° C. (138.2° to 141.8° F.); they are odorless and tasteless or nearly so. It is practically insoluble in water, sparingly soluble in ether, but readily soluble in hot alcohol. It contains 54 per cent. of guaiacol.

It forms with sulphuric acid a permanent yellow coloration which on the addition of acetone assumes a characteristic, brilliant cherry red color, distinguishing it from salol, which gives a yellow color. Ferric chloride produces in the benzosol sulphuric acid mixture a violet color, changing to green and blue, and on the further addition of nitric acid, to orange and green, or of potassium nitrite to green, violet and yellow. When heated (saponified) with alcoholic potash, the odor of guaiacol is developed.

It is incompatible with the alkalies, which split up benzosol into guaiacol and benzoic acid.

Actions and Uses.—Benzosol is decomposed slowly in the intestinal tract into guaiacol and benzoic acid which exert their usual actions. The liberated constituents are absorbed and excreted in the urine. It is claimed to be not irritating.

Its uses are analogous to those of creosote and of benzoic acid. It is said to be useful in incipient pulmonary tuberculosis, as an intestinal antiseptic in fermentation, diarrhea, typhoid fever, diabetes mellitus and as a urinary disinfectant in cystitis, etc. **(See note under Beta-naphthol Benzoate.)**

Dosage.—0.2 to 0.6 Gm. (3 to 10 grains), in powder, capsule, pill, or suspended in liquids or as an emulsion.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 453,035 (expired).

GUAIACODEINE. — Codeine - Ortho - Guaiacol - Sulphonate. Guaiacodeine is Codeine - Ortho - Guaiacol - Sulphonate $C_{18}H_{21}NO_3C_6H_4(OH)(OCH_3)(HSO_3)1:2:6 = C_{26}H_{29}O_6NS$, the neutral codeine salt of guaiacol sulphonic acid.

Guaiacodeine is produced by the double decomposition of a soluble salt of codeine with the potassium or barium salts of ortho-guaiacol-sulphonic acid taken in molecular quantities.

It is a white crystalline powder Soluble in 90 parts of water, 450 parts of alcohol and 30 parts of methyl alcohol, insoluble in ether; very slightly soluble in chloroform. Very soluble in hot water.

A drop of solution of ferric chlorid added to a solution of the salt in water or alcohol produces a deep blue color, indicating the presence of ortho-guaiacol-sulphonic acid.

The salt melts between 163° C. and 165° C. (325.4 and 327.20 F.) to a white liquid. 0.1 Gm. dissolves in 10 Cc. concentrated sulphuric acid without color.

Theoretically the salt contains 59.44 per cent. anhydrous codein, or 63.20 U. S. P. codeine (containing 1 molecule of water of crystallization) and 40.56 per cent. ortho-guaiacol-sulphonic acid.

Ammonia and alkalies precipitate from a concentrated solution of the salt the alkaloid, codeine, which should respond to the tests of the U. S. P. for that alkaloid

Actions and Uses.—Those of Codeine. Since the proportion of guaiacol is small it cannot well be used to secure the action of this agent.

Manufactured by the New York Quinine and Chemical Works, New York.

U. S. patent No. 963,254 (July 5, 1910; expires 1927). Not trademarked.

GUAIACOL-SALOL—Guaiacolis Salicylas.—Salicylate of Guaiacol.—Guaiacol-salol is guaiacyl salicylate, $C_6H_4.OH.COO(.C_6H_4.OCH_3) = C_{14}H_{12}O_4$, the salicylic acid ester of guaiacol, closely related to phenyl salicylate (salol).

It is prepared by treating a mixture of sodium salicylate and sodium guaiacolate, in molecular proportions, with phosphorus oxychloride, washing the product of the reaction with water and crystallizing from alcohol.

It is a white crystalline powder, tasteless, but having a salol-like odor. It is insoluble in water, but soluble in alcohol, ether and chloroform. It melts at 65° C. (149° F.).

Being an ester, it is decomposed by alkalies and alkaline carbonates with the formation of alkali salicylate and alkali guaiacol and salicylic acid. The alcoholic solution is colored wine red by the addition of ferric chloride, but if the alcoholic solution be dropped into a watery solution of ferric chloride a turbidity but no coloration is produced.

Actions and Uses.—This compound acts like its constituents, being antiseptic and antirheumatic. It is said to be useful in phthisical diarrhea, dysentery, rheumatism, marasmus, chorea, etc. **(See note under Beta-naphthol Benzoate.)**

Dosage.—1 Gm. (15 grains).

Manufactured by Fabrik von Heyden, Radebeul, near Dresden, Germany (Merck & Co., New York).

GUAIAMAR — Guaiacolglycerylester.—Guaiamar is glyceryl guaiacolate, $C_6H_4.OCH_3.O(CH_2OH.CHOH.CH_2)$, $1:2 = C_{10}H_{14}O_4$, the monoguaiacol ester of glycerin.

It is prepared by the reaction of two molecules of sodium hydroxide, one of guaiacol and two of monochlorhydrin at from 140° to 150° C. (284° to 302° F.). When the alkaline reaction has disappeared, the mass is diluted with water which leaves the greater part of the glycerin ester undissolved. The portion dissolved in the water solution may be extracted from the latter by ether.

It is a white crystalline, non-hygroscopic powder, melting at 75° C. (167° F.) and having a bitter, aromatic taste. It is soluble in 250 parts of water at the ordinary temperature, but dissolves best in warm water; it is soluble in alcohol, chloroform, ether and glycerin. Its solutions are neutral to test paper. It is decomposed by soluble hydroxides and carbonates and by strong acids.

Actions and Uses.—Guaiamar liberates guaiacol, partly in the stomach and partly in the intestinal canal, it being split up by the gastric and intestinal contents, with the assimilation of one molecule of water, into guaiacol and glycerin. By this evolution of guaiacol it is believed to exert an antiseptic action in the intestinal canal. It is said not to interfere with the normal process of digestion, but, on the contrary, exerts a tonic action. **(See note under Beta-naphthol Benzoate.)**

It is intended to be used as a substitute for guaiacol in any cases where the latter is indicated. In the form of ointment it has been recommended in acute articular rheumatism.

Dosage.—0.3 to 1.3 Gm. (5 to 20 grains) in capsules or dissolved in warm water. Locally, in the form of 25 per cent. ointment with wool fat (lanolin), by itself, or combined with belladonna, zinc or mercurial ointment, etc.

Manufactured by Mallinckrodt Chemical Works, St. Louis. U. S. patent No. 599,123 (Feb. 15, 1898; expires 1915).

GUJASANOL — Diethylglycocoll-Guaiacol Hydrochloride.—Gujasanol, $C_6H_4(OCH_3)(CH_2N(C_2H_5)_2COO).HCl = C_{13}H_{19}NO_4.HCl$, is the hydrochloride of diethylglycocoll guaiacol.

It is prepared by the action of chloracetylchloride on guaiacol and decomposition of the product with diethylamine.

It forms small, colorless, prismatic crystals, melting at 183° to 184° C. (361.4° to 363.2° F.), having a slight odor of guaiacol and a bitter saline taste. It is soluble in its own weight of water and in 25 parts of alcohol, but insoluble in ether.

The solution in water should be clear, colorless, and give a white precipitate with silver nitrate. The oily base separates on the addition of an alkali hydroxide. When incinerated on platinum it leaves no residue.

It is incompatible with alkalies and their carbonates.

Actions and Uses.—It is antiseptic and anesthetic. It is readily absorbed and splits off guaiacol in the organism with facility. Its antiseptic power is said to be about equivalent to that of boric acid.

Gujasanol has been recommended for the treatment of tuberculosis, both internally and subcutaneously. It is also said to be useful as a deodorant and to have given good results in putrid cystitis.

Dosage.—1 to 3 Gm. (15 to 45 grains) in wafers; subcutaneously, 3 to 4 Gm. (45 to 60 grains) in 20 per cent. aqueous solution; locally it may be used in from 0.1 to 2 per cent. solutions.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 624,772 (May 9, 1899; expires 1916).

MONOTAL—Guaiacolis Methylglycolas.—Monotal is guaiacyl methyl glycolate, $CH_3(O.CH_3).COO.(C_6H_4.OCH_3)=C_{10}H_{12}O_4$, the methyl-glycolic acid ester of guaiacol.

Monotal is prepared by the action of methoxacetyl chloride on guaiacol.

Monotal occurs as a limpid, colorless oil, of a faintly aromatic odor, easily soluble in alcohol, ether, benzol, and chloroform; difficultly soluble in water. It is soluble in about 6 parts of olive oil. It boils under 15 mm. pressure at about 156° C. (312.8° F.). It is split up into guaiacol and methylglycolic acid when treated with caustic alkalies.

Monotal is easily saponified by aqueous or alcoholic solutions of potassium hydroxide and then gives the reactions characteristic of guaiacol and methylglycolic acid. When incinerated on platinum foil it leaves no residue. Its watery solution is not rendered turbid by solution of silver nitrate. It has a specific gravity of 1.17 to 1.18 at 20° C.

Actions and Uses.—Monotal is said to give the systemic effects of guaiacol without having its caustic and poisonous properties. It is easily absorbed by the skin. (See note under Creosote Carbonate.)

It is said to be useful as an analgesic for various painful affections in phlebitis and in pulmonary tuberculosis.

Dosage.—2 to 4 Cc. (½ to 1 fluidram) rubbed in or painted over the affected area once or twice daily.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 822,339 (June 5, 1906; expires 1923). U. S. trademark No. 62,612.

STYRACOL—Guaiacolis Cinnamas.—Guaiacol Cinnamate.—Styracol is guaiacyl cinnamate, $C_6H_5CH:CH.COO(C_6H_4.OCH_3=C_{16}H_{14}O_3$, the cinnamic acid ester of guaiacol.

It is prepared by allowing guaiacol and cinnamyl chloride in molecular proportions to react on each other for two hours at the ordinary temperature, then heating the mixture on the water bath for a short time and purifying the product of the reaction by several crystallizations from boiling alcohol.

It forms colorless, odorless and tasteless crystalline needles, melting at 130° C. (266° F.). It is insoluble in water, but easily soluble in alcohol, acetone, chloroform and benzine. It contains 55 per cent. of guaiacol, which is split off by the action of alkalies.

It is incompatible with alkalies.

Actions and Uses.—Styracol is claimed to be an intestinal antiseptic and to combine the antituberculous actions of guaiacol and cinnamic acid. It is said to liberate in the intestinal canal a larger proportion of its guaiacol (up to 85 per cent.) than other synthetic preparations of that substance.

It is said to be useful in the initial stage of phthisis, chronic enteritis and intestinal disturbances in general, catarrh of the bladder, etc. (See note under Beta-naphthol Benzoate.)

Dosage.—1 Gm. (15 grains) in powder or tablets.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. German patent No. 62,176. U. S. trademark No. 42,487.

THIOCOL — Potassii Guaiacolsulphonas.—Potassium Guaiacol-Sulphonate.—Thiocol is potassium guaiacol sulphonate, $C_6H_2(OH)(OCH_3)(KSO_3)1:2:6=C_7H_7O_5KS$, the potassium salt of ortho-guaiacol sulphonic acid.

It is prepared by sulphonating guaiacol at a temperature not exceeding 70° to 80° C. (158° to 176° F.) with concentrated sulphuric acid, converting the guaiacol sulphonic acid produced into the barium salt, and this by double decomposition with potassium sulphate into the potassium guaiacolsulphonate.

It is a colorless, crystalline powder, neutral or faintly alkaline, odorless, and having a faint bitter, followed by a sweet taste.

It is readily soluble in water, slightly soluble in ordinary alcohol, but insoluble in absolute alcohol and in ether or oils.

Its aqueous solution is not precipitated by barium chloride; ferric chloride produces an intense violet-blue color, which disappears on the addition of ammonia, or of concentrated solution of alkali chlorides or sulphates.

Actions and Uses.—Thiocol is said to be non-irritating to the mucous membranes of the digestive tract, readily absorbed, and is claimed to promote appetite and improve nutrition.

It is claimed that it is useful in pulmonary tuberculosis, acute and chronic bronchitis, pneumonia, whooping cough, emphysema of the lungs, etc., as a means of lessening expectoration, diminishing night sweats and improving nutrition.

Dosage.—0.3 to 1.3 Gm. (5 to 20 grains), in solution with orange syrup or in tablets.

Manufactured by F. Hoffmann-LaRoche & Co., Basel, Switzerland (The Hoffmann-LaRoche Chemical Works, New York). U. S. patent No. 650,218 (May 22, 1900; expires 1917). U. S. trademark No. 78,327.

Syrup Thiocol Roche.—A syrup containing thiocol 10.5 Gm. in 100 Cc. (6 grains in a fluidram).

HEDONAL — Methylpropylcarbinol Urethane.—Pentan-2-Ol-urethane.—Hedonal is pentan-2-ol urethane, $CH_3.CH_2.CH_2.CH(CH_3)O.CO.NH_2=C_6H_{13}O_2N$. It is a derivative of urethane differing from ethyl carbamate, U. S. P., in that the ethyl radicle has been replaced by the radicle of methyl-propylcarbinol (pentan-2-ol).$CH_3.CH_2.CH_2.CHOH.CH_3$.

It is prepared by heating the secondary methylpropylcarbinol or pentan-2-ol, $CH_3.CH_2.CH_2.CHOH.CH_3$ with urea nitrate under pressure (U. S. patent No. 659,202), also by other methods (German patents Nos. 120,863, 120,864, 120,865).

It is a white, crystalline powder, having a faint aromatic odor and taste, melting at 74° C. (165.2° F.), and boiling at 215° C. (419° F.). It dissolves in 120 parts of water at 37° C. (98.6° F.), but is more soluble at higher temperatures and is readily soluble in alcohol, ether, chloroform and other organic solvents. It is readily volatilized with the vapors of water or alcohol, and when boiled with alkalies is split up into its constituents, methylpropylcarbinol, ammonia and carbon dioxide.

On boiling with dilute sodium hydroxide, ammonia is evolved and recognized by the odor and the usual reagents; if then an aqueous solution of iodine in potassium iodide is added, and the mixture allowed to cool, the odor of iodoform derived from the alcohol is distinctly manifested.

It is incompatible with alkalies, their carbonates and bicarbonates.

Actions and Uses.—Hedonal appears to have a greater hypnotic effect than ethyl carbamate. It is said to be followed by no after-effects and is oxidized in the body to urea and carbon dioxide. It is employed in insomnia due to mental overwork or nervous excitement occurring in the course of neurasthenia or hysteria. It is claimed to be particularly useful preliminary to anesthesia, a hypnotic dose being given and anesthesia effected with chloroform after the patient has been asleep for an hour.

Dosage.—1 to 2 Gm. (15 to 30 grains), administered dry, followed by a swallow of water, or in wafers or capsules.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 659,202 (Oct. 9, 1900; expires 1917); German patents Nos. 11,496, 120,863, 120,864, 120,865.

Hedonal Tablets, 8 grains.—Each tablet contains hedonal 0.52 Gm. (8 grains).

HEMABOLOIDS.—Hemaboloids is a liquid said to contain in each 100 Cc. iron, combined with proteins, equivalent to 0.40 Gm. elementary iron, proteins and nucleoproteins (nitrogen x 6.25) 4.0 Gm., bone marrow extract 5.0 Gm., nuclein 0.04 Gm., in a menstruum containing 17 per cent. alcohol by volume. It is claimed that 75 per cent. of the iron is in a stable organic combination with vegetable nucleoproteins and does not react with hematoxylin (see Organic Iron), while the remaining 25 per cent. is more loosely combined.

Actions and Uses.—Hemaboloids is claimed to act as a promptly absorbable and non-irritant form of food-iron. It is said not to constipate nor stain the teeth.

Dosage.—15 Cc. (½ fluidounce) after each meal. Children in proportion. Each average dose of 15 Cc. (½ fluidounce) contains iron 0.06 Gm. (0.92 grains), proteins and nucleoproteins 0.62 Gm. (9.6 grains), bone marrow extract 0.775 Gm. (12 grains), nuclein 0.006 Gm. (0.1 grain).

Manufactured by the Palisade Manufacturing Company, Yonkers, N. Y. U. S. trademark.

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HEMOGLOBIN DERIVATIVES.

Hemoglobin is the coloring matter of the blood corpuscles and is the most important iron-containing compound of the body. It exists in venous blood as hemoglobin, sometimes called reduced hemoglobin, and in the lungs takes on oxygen in a loose chemical combination becoming oxyhemoglobin.

Hemoglobin is obtained from oxyhemoglobin by the action of various reducing agents.

When ingested it is decomposed in the stomach, being converted into a protein, globin, and into hematin, an acid non-albuminous substance, containing the iron of hemoglobin. The same decomposition is produced by heating in solution to 70°, and by various chemical agents. It is doubtful whether hematin is absorbed into the blood from the gastrointestinal canal.

Various preparations of hemoglobin have been put on the market. These are of two classes. 1. Preparations consisting essentially of oxyhemoglobin usually sold under the name hemoglobin. 2. Preparations derived by the action of reducing agents on the blood, such as zinc, pyrogallol, etc. They consist of reduced hemoglobin, or of some modification of it.

CUPRO-HEMOL—Hæmolum Cupratum.—Cupro-hemol is hemol containing 2 per cent. of copper and 0.4 per cent. of iron in organic combination.

It is prepared by precipitating a solution of blood with a dilute neutral solution of a copper salt at a temperature not materially exceeding 0° C. (32° F.).

Actions and Uses.—Cupro-hemol is said to be useful in tuberculosis, scrofula, anemia, chlorosis, etc.

Dosage.—The maximum dose is 0.5 Gm. (8 grains).

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). German patent No. 86,146.

HEMOGALLOL.—Hemogallol is an organic iron compound produced from blood by reduction of its hemoglobin by means of pyrogallol.

Fresh defibrinated blood suitably diluted with water is mixed with an equal volume of saturated solution of pyrogallol which causes the precipitation of a voluminous precipitate which is separated, washed with water to remove pyrogallol, and finally with alcohol.

It is a reddish-brown, almost tasteless powder, insoluble in water, alcohol, etc.

It does not show the spectroscopic absorption bands of hemoglobin between D and E.

Actions and Uses.—It is claimed that hemogallol acts as a preparation of organic iron (see Organic Iron).

It is claimed to be useful in anemia, chronic nephritis, and convalescence.

Dosage.—0.25 to 0.5 Gm. (4 to 8 grains), one-half hour before meals in powder with sugar or in tablets.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 541,096 (June 18, 1895; expires 1912).

HEMOGLOBIN — Hæmoglobinum. — Hæmoglobin, Hæmatocrystallin. Hemoglobin is the red coloring matter of blood.

Hemoglobin is a brownish-red powder, soluble in water. It is decomposed by extremely small amounts of acids, coagulates at 64° C. (147.2° F.) and is dextro-rotatory. It does not give characteristic albumin or iron reactions until decomposed. A solution mixed with a little sodium chlorid, evaporated over sulphuric acid to a syrupy consistence, mixed with 15 times its volume of glacial acetic acid and heated on a water bath for several hours, yields on cooling flat rhombic crystals of haematin hydrochloride with a dark violet-red color and metallic luster.

Action and Uses.—See organic iron. It is converted into hematin in the stomach.

Dosage.—0.3 to 2 Gm. (5 to 30 grains).

HEMOL—Hæmolum.— Reduced Hemoglobin—Parahemoglobulin—Hemoglobin Deoxidized by Zinc, Merck.—Hemol is an organic iron compound produced from blood by reduction, said to contain about 3 per cent. of iron in organic combination.

Neutralized blood is shaken with zinc dust and water, and the zinc removed from the product of the reduction (Zinc parahemoglobulin).

Hemol is a dark-brown, almost tasteless powder, insoluble in water, alcohol, etc. It contains traces of zinc oxide. The amount of iron may be determined by the method described in Merck's Prüfungsvorschriften für die pharmazeutischen Spezial-Präparate.

Actions and Uses.—It is claimed to have the action of an organic iron compound.

Hemol is claimed to be useful in anemia, chlorosis, etc.

Dosage.—0.12 to 0.5 Gm. (2 to 8 grains) in powder with sugar or in wafers.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 541,933 (July 2, 1895; expires 1912).

HEXAMETHYLENAMINE AND HEXAMETHYLENAMINE COMPOUNDS

Hexamethylenamine is official in the United States Pharmacopeia. For description see the pharmacopeia, or the Physician's Manual of the United States Pharmacopeia and National Formulary.

AMINOFORM. — A name applied to Hexamethylenamina, U. S. P.

Sold by C. Bischoff & Co., New York.

FORMIN.—A name applied to Hexamethylenamina, U. S. P.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

UROTROPINE.—A name applied to Hexamethylenamina, U. S. P.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. trademark No. 58,394.

HEXAMETHYLENAMINE METHYLENCITRATE — Hexamethylenaminæ Methylencitras.—Hexamethylenamine methylencitrate, $C_6H_4O_7(CH_2)_6N_4 = C_{19}H_{28}O_7N_4$, is a compound of hexamethylenamine with anhydromethylencitric acid.

It is a white, crystalline powder, melting with decomposition at 165° to 175° C. (329° to 347° F.), having an agreeable, acidulous taste and acid reaction. It is soluble in about 10 parts of water, but almost insoluble in alcohol and ether. By dilute acids and more easily by alkalies it is decomposed with the liberation of formaldehyde. On addition of 1 per cent. solution of phloroglucin to a solution of hexamethylenamine methylencitrate, followed by sodium hydroxide, the intense rose-red color characteristic of the liberated formaldehyde is developed.

It is incompatible with acids and alkalies.

Actions and Uses.—It is a urinary antiseptic and germicide claimed to be more prompt and energetic in its action than hexamethylenamine, acting equally well whether the urine be alkaline or acid in reaction, rapidly clearing it up and allaying pain.

It is said to be useful in cystitis, pyelitis, prostatic diseases and urethritis. It is also said to be an efficient urinary antiseptic in infectious diseases in which bacteria are present in the urine.

It may be used as a phophylactic against infection in case of operations or instrumental manipulation of the genito-urinary tract.

Dosage.—0.6 to 1 Gm. (10 to 15 grains).

Proprietary Preparation.

HELMITOL.—A name applied to Hexamethylenamine Methylencitrate.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 722,275 (March 10, 1903; expires 1920). U. S. trademark No. 39,580.

Helmitol Tablets, 5 grains. Each tablet contains helmitol 0.3 Gm. (5 grains).

SALIFORMIN—Hexamethylenaminæ Salicylas, Merck.—Hexamethylenamine salicylate, Merck.—Saliformin is hexamethylenamine salicylate, $(CH_2)_6N_4C_6H_4.OH.COOH$, a weak salt of hexamethylenamine and salicylic acid.

It is prepared by dissolving equal weights of hexamethylenamine and salicylic acid in water and evaporating the solution to dryness at a temperature below 60° C. (140° F.).

It is a white, crystalline powder, having an acidulous and disagreeable taste, readily soluble in water or alcohol.

It is soluble in cold sulphuric acid without color, becoming crimson on heating. Its aqueous solution is colored deep green by copper sulphate, violet by ferric chloride, and forms a yellow precipitate with bromine.

It is decomposed by basic substances (soluble hydroxides, carbonates, etc.) and by strong acids. It is incompatible with salts of iron and other metals which form insoluble compounds with salicylates.

Actions and Uses.—Saliformin is recommended as a genito-urinary antiseptic and uric-acid solvent. Its action does not differ materially from that of a mixture of hexamethylenamine and salicylic acid, for it is largely hydrolysed into its constituents in the presence of water.

It is said to be useful in cystitis, lithiasis and bacterial affections of the urinary passages, also in gout, etc.

Dosage.—0.3 to 2 Gm. (5 to 30 grains) in tablets or elixir.

Manufactured by E. Merck, Darmstadt (Merck & Co., New York).

HOLOCAINE HYDROCHLORIDE—Holocainæ Hydrochloridum.—Ethenyl-Paradiethoxy-Diphenyl-Amidine Hydrochloride.—Holocaine hydrochloride is phenetidyl-acetphenetidin hydrochloride, $CH_3C(:N.C_6H_4.OC_2H_5).(NH.C_6H_4.OC_2H_5).HCl=C_{18}H_{23}N_3O_2HCl$. Phenetidyl-acetphenetidin hydrochloride is the hydrochloride of a basic condensation product of para-phenetidin (para-ethoxy-amino-benzene) and acetparaphenetidin (phenacetin).

It is prepared by the interaction of molecular proportions of paraphenetidin sulphate and acetphenetidin (phenacetin) in the presence of phosphorus oxychloride, decomposing the resulting holocaine sulphate with sodium hydroxide, crystallizing the base from alcohol, neutralizing it with hydrochloric acid, and crystallizing.

It forms small, colorless crystals, neutral or faintly alkaline, melting at 189° C. (372.2° F.), odorless, faintly bitter and producing transient numbness on the tongue. It is soluble in 50 parts of water and freely soluble in alcohol. On boiling in glass vessels the aqueous solution becomes turbid, owing to a separation of a small quantity of the free base by alkali derived from the glass.

It should form a clear, colorless solution in water, neutral or faintly alkaline, yielding a white precipitate on addition of silver nitrate or of ammonia. The base obtained by precipitation with ammonia and crystallized from alcohol forms colorless needles, which melt at 121° C. (249.8° F.). Incinerated on platinum, it leaves no weighable residue.

It is incompatible with alkalies and their carbonates and the usual alkaloidal reagents. Glass vessels should be avoided in preparing the solution, porcelain being used instead.

Actions and Uses.—It is a local anesthetic like cocaine, but having the advantage of a quicker effect and an antiseptic action. Five minims of a 1 per cent. solution when instilled into the eye are usually sufficient to cause anesthesia in from 1 to 10 minutes. It is said not to cause the scaliness of the cornea which sometimes results after the use of the older remedy.

Dosage.—It is applied in a 1 per cent. aqueous solution prepared in porcelain vessels.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). German patents Nos. 79,868, 80,568.

HOMATROPINE HYDROCHLORIDE—Homatropinæ Hydrochloridum.—Homatropine Hydrochloride, $C_{16}H_{21}NO_3HCl$, is the hydrochloride of the alkaloid homatropine, obtained by the condensation of tropine and mandelic acid.

Homatropine hydrochloride occurs as small white crystals, soluble in water and alcohol and melting at 216° to 217° C. (420.8° to 422.6° F.).

If sulphuric acid containing a trace of potassium dichromate be added to a crystal of the salt an evanescent pink color will be produced which rapidly changes to green. If 0.01 Gm. of the salt be added to 5 drops of nitric acid and evaporated to dryness in a porcelain dish the residue should not acquire a violet red color upon the addition of a few drops of alcoholic potassium hydroxide test solution (absence of atropine, hyoscyamine or hyoscine). If 1 Cc. of an aqueous solution of the salt (1 to 100), be made alkaline with ammonia water, shaken out with chloroform and the chloroformic solution evaporated to dryness, the residue should turn yellow and finally brick red when warmed with about 1.5 Cc. of a solution of 1 part mercuric chloride in 30 parts of a mixture of 5 volumes alcohol and 3 of water (absence of most other alkaloids except atropine and hyoscyamine). If to an aqueous solution containing 0.1 Gm. of the salt an excess of potassium hydroxide test solution be added, liquid extracted with ether and the latter evaporated spontaneously, the crystals which form should melt at 96° C. (204.8° F.).

Actions and Uses.—Homatropine is less poisonous than atropine, but the same symptoms are produced by it when exhibited in large doses.

The hydrochloride is used as a mydriatic in ophthalmic surgery. The mydriatic effect begins in ¼ to ½ hour and reaches a maximum in one hour and disappears in 36 to 48 hours. Accommodation paresis ceases earlier.

Homatropine hydrochloride is given for the same indications as the hydrobromide, but has no advantage over the latter.

Dosage.—It is applied to the eye in 1 per cent. solution.

ICHTHYOL AND RELATED COMPOUNDS

ICHTHYOL—Ammonii Ichthosulphonas.—Ammonium Sulpho-Ichthyolate. Ammonium Ichthyol Sulphonate. Ammonium-Ichthyol.—Ichthyol consists largely of the ammonium salts of sulphonic acids derived from the tar of a bituminous shale which is found in the Tyrol and which contains the remains of many fossil fishes. The exact composition and nature of ichthyol is still doubtful.

It is prepared by dry distillation of the bituminous mineral, sulphonating the crude volatile oil obtained with concentrated sulphuric acid, removing the excess of sulphuric acid by repeated precipitation with strong brine, and saturating the ichthyolsulphonic acid with strong ammonia.

Ichthyol is a brown, viscid liquid, translucent in thin layers, having a bituminous odor and taste. It is soluble in water and in mixtures of equal volumes of alcohol and ether, but insoluble in the last two liquids by themselves. It is miscible with glycerin, oils and fats. It contains about 10 per cent. of sulphur in natural combination, and further 7 per cent. introduced by the sulphonation.

Ichthyol is precipitated from its aqueous solutions by acids, and the dark, resinous mass thus formed is soluble in ether and in pure water, but not in dilute acids or in salt solutions. The fixed alkalies develop the odor of ammonia, and if the mass is then dried and carbonized, the residual mass gives off hydrogen sulphide on addition of hydrochloric acid. When dried on a water bath it yields about 55 per cent. of residue.

It is incompatible with acid and saline solutions, fixed alkalies, their carbonates and iodides, alkaloidal salts, mercuric chloride, etc.

Actions and Uses.—Ichthyol penetrates the unbroken skin and, it is claimed, acts as a vasoconstrictor on mucous surfaces. It has an antiseptic action and is believed to act as an alterative in consequence of the sulphur which it contains.

It is said to be useful internally in phthisis, skin diseases, scrofula, etc. Externally it has been applied in erysipelas, burns, chilblains, carbuncles, rheumatism, ivy poisoning, etc., also in uterine and vaginal inflammations, gonorrhea, etc.

Dosage.—Internally, 0.2 to 2 Cc. (3 to 30 minims) mostly in simple solution in water, or peppermint water, sometimes in the form of pills or capsules. Locally, in vaginal, uterine or rectal suppositories, in 0.06 to 0.18 Cc. (1 to 3 minims) bougies, or 1 to 3 per cent. solution for gonorrheal treatment.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York). German patent No. 35,216. U. S. trademark.

CALCIUM ICHTHYOL.—A derivative of ichthyol in which calcium is substituted for ammonium.

It is a brown, tasteless powder, insoluble in water, and containing 2.5 per cent. of calcium.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York).

ICHTHALBIN—Ichthyol Albuminate.—A compound of ichthyolsulphonic acid and albumin analogous to tannalbumin.

It is prepared by precipitating a solution of ichthyol and albumin with diluted sulphuric acid and removing adhering odorous oil by heating the well washed and dried precipitate for 24 hours at 120° C. (248° F.), or by washing with alcohol, benzene, petroleum benzin, chloroform, etc.

It is an extremely fine, grayish white powder, odorless and practically tasteless. It is insoluble in water, in the gastric juice or in acid liquids, but completely soluble in alkaline liquids.

Actions and Uses.—Its actions and uses are the same as those of ichthyol, with the asserted advantage of freedom from such side effects as nausea, eructations, etc. It is recommended for the same purposes as ichthyol.

Dosage.—For infants 0.13 to 0.3 Gm. (2 to 5 grains), in gruel; older children, 0.6 to 1 Gm. (10 to 15 grains), mixed with scraped chocolate; adults, 1 to 1.3 Gm. (15 to 20 grains), in chocolate tablets.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York. English patent No. 11,344. U. S. trademark No. 31,114.

ICHTHARGAN—Argenti Ichthosulphonas.—Silver Sulphichyolate—Silver Ichthyolate.—A compound of ichthyol and silver claimed to contain 30 per cent. of metallic silver and 15 per cent. of sulphur in organic combination.

It is prepared, according to the patent specifications, by neutralization of ichthyol sulphonic acid with silver oxide and extracting the water soluble silver ichthyol sulphonate.

It is a brown, amorphous, perfectly stable powder, having a faint chocolate-like odor. It is freely soluble in water, glycerin, or diluted alcohol, but insoluble in absolute alcohol, ether or chloroform. Its aqueous solution darkens with precipitation of metallic silver when exposed to the light, but is said to suffer no change in amber colored bottles.

It is incompatible with the soluble chlorides. Its solutions should not be exposed to the light.

Actions and Uses.—It is said to be bactericide, astringent and antiphlogistic. It is reported to combine the bactericidal action of the silver salt with the penetrating and antiphlogistic action of ichthyol.

It is recommended in gonorrhea in all its forms as a succedaneum for organic salts of silver. It is claimed to be the strongest in silver content of all the various organic compounds of silver introduced in late years.

Dosage.—0.04 to 0.2 per cent. solution in gonorrhea; 3 per cent. solution in posterior urethritis; ½ to 3 per cent. solution in trachoma.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York). German patent No. 112,630.

ICHTHERMOL—Hydrargyri Ichthosulphonas.—Mercury Ichthyolate.—A compound of ichthyosulphonic acid and mercury, containing 24 per cent. of metallic mercury.

It is a dark colored, odorless powder, insoluble in water.
Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York).

ICHTHOFORM—Ichthyol Formaldehyde.—A compound of ichthyol and formaldehyde.

It is a dark brown, practically odorless, and tasteless powder. It is permanent and insoluble in the usual solvents.

Actions and Uses.—Ichthoform is said to be antiseptic and antiphlogistic. It is reported to be efficacious in arresting intestinal decomposition and inflammation, and to be non-toxic. (See note under Beta-naphthol Benzoate and under Creosote Carbonate.)

It is recommended by the manufacturer locally in endometritis, in ozena, and in wounds, ulcers, etc.

Dosage.—Internally, 0.6 to 2 Gm. (10 to 30 grains), in powders taken plain, or suspended in gruel or cacao, or as a "shake" mixture; externally as pure powder, as 30 to 50 per cent. triturations, or as 10 to 25 per cent. ointments.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York). German patent No. 107,233.

FERRICHTHYOL—Ferric Ichthyol. — A derivative of ichthyol in which about 2.5 per cent. of iron is contained.

It is a brown-black, voluminous, non-hygroscopic powder, nearly odorless and tasteless. It is insoluble in the ordinary solvents as also in diluted acids and alkalies.

Actions and Uses.—It is said to be alterative, antiseptic, hematinic and tonic. It is recommended in anemia, chlorosis, etc.

Dosage.—1 to 2 Gm. (15 to 30 grains) in tablets.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York).

LITHIUM ICHTHYOL.—A lithium derivative of ichthyol.

It is a dark brown mass, somewhat more consistent, but otherwise resembling ammonium ichthyol in appearance.

Actions and Uses.—It is an antiseptic and bactericide. It is claimed to be useful as a wound antiseptic.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York).

SODIUM ICHTHYOL—Sodii Ichthosulphonas.—Sodium Ichthyolsulphonate.—A derivative of ichthyol containing sodium instead of ammonium.

It is prepared by neutralizing ichthyolsulphonic acid with solution of sodium hydroxide and evaporating the excess of water.
It is a dark brown mass, more solid in consistency than ammonium ichthyol, otherwise having identical physicial properties. It contains 15 per cent. of sulphur.
It is distinguished from ichthyol by not giving off ammonia on the addition of sodium hydroxide.

Actions, Uses and Dosage.—These are the same as those of ichthyol. Its firmer consistence makes it more suitable for pills.

Manufactured by the Ichthyol Co., Hamburg, Germany (Merck & Co., New York). German patent No. 107,233.

TUMENOL—Tumenol Venale.—Tumenol is a crude mixture of tumenol sulphone and tumenol sulphonic acid derived from bituminous shale.

It is prepared by sulphonating the mineral oil obtained by the distillation of bituminous shale quarried in the Mossel mine.
It is a dark oil of syrupy consistency, almost insoluble in water, but easily soluble in fats.

Actions and Uses.—It is said to be a non-toxic and non-irritant protective and palliative to the skin.

It is said to be useful in eczema, excoriations, erosions, superficial ulcerations and burns as a palliative and protective covering, etc.

Dosage.—As 5 to 20 per cent. ointment or 10 per cent. solution in water or glycerin and in the form of soap plaster (with salicylic acid).

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). German patent No. 56,401.

TUMENOL-AMMONIUM.—Tumenol-ammonium is the ammonium salt of tumenol sulphonic acid.

Tumenol-ammonium is a dark oil with a faint tarry odor and acrid taste. It is soluble in water in all proportions with a neutral reaction. It is also soluble in alcohol, ether and glycerin.

Actions and Uses.—See Tumenol.

Dosage.—Tumenol-ammonium is applied as a local dressing in the form of a 5 to 10 per cent. aqueous solution, a 5 to 20 per cent. tincture containing equal parts of ether, alcohol and water or glycerin, and as a 5 to 20 per cent. ointment. The manufacturers state that its use is to be preferred to that of the ordinary tumenol.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). Not patented in U. S.

IODALBIN.—Iodalbin is a compound of iodine and blood albumin, containing approximately 21.5 per cent. of iodine.

It is prepared by treating blood albumin with a solution of iodin whereby an insoluble precipitate is produced. This precipitate is separated, purified by the removal of free iodin, dried, powdered and assayed.
Iodalbin is a reddish colored powder, practically tasteless and possessing a peculiar, rather pleasant odor, suggestive of cane syrup or molasses. It is almost insoluble in water, acids, alcohol and other ordinary solvents, but is readily soluble in strong alkaline solutions; more slowly soluble in dilute alkaline solutions. On heating it evolves iodine vapors copiously and is subsequently consumed to an ash, leaving a small amount of residue.
Tests. The presence and amount of iodine can be determined by the usual processes for detecting and estimating this element in organic substances.

Actions and Uses.—When administered to animals Iodalbin appears to suffer little change in the acid contents of the stomach, but on passing into the intestines it is dissolved by contact with the alkaline secretion and on absorption exerts a physiologic action similar to that of the soluble iodides. It is indicated in the same cases as the soluble iodides.

Dosage.—0.3 to 0.6 Gm. (5 to 10 grains) repeated according to indications, or until the desired effects are obtained.

Manufactured by Parke, Davis & Co., Detroit, Mich. Not patented or trademarked.
Iodalbin Capsules, 5 grains.—Each capsule contains Iodalbin 0.3 Gm. (5 grains).

IODIPIN—Iodized Sesame Oil.—Iodipin is an iodine addition product of sesame oil.

It is prepared by the action of iodine chloride on sesame oil in sufficient quantity, theoretically calculated, to produce the required iodization.
It is a yellow, oily liquid, having a purely oleaginous taste. It is insoluble in water.
If to 1 Cc. of Iodipin in 10 Cc. of chloroform a few drops of phenolphthalein test solution are added, the addition of one drop of half normal potassium hydroxide V. S. should produce a red color (limit of acidity).
Estimation of iodine: 3 Gm. of Iodipin, 10 per cent., or 1 Gm. of Iodipin, 25 per cent., are saponified by heat with 5 Gm. of potassium hydroxide and 25 Cc. of alcohol. The solution is evaporated to dryness on the water bath and the residue carefully incinerated. The residue is extracted with water and the washings filtered into a Topf distilling apparatus. Then 10 Cc. of hydrochloric acid and 10 Cc. of ferric chloride solution are added and the liberated iodine distilled with the usual precautions into a solution of potassium iodide. Finally the iodine is determined by titration with tenth normal sodium thiosulphate solution V. S. and the per cent. of iodine calculated.

Actions and Uses.—Iodipin acts in the system similarly to the iodides, being broken up in a manner analogous to that described under bromipin, which see. Its action is claimed to be more lasting and iodism is less likely to be caused.

Dosage. 2 to 6 c.c. (30 to 90 minims) of iodipin, 25 per cent. hypodermically or 4 to 8 Cc. (1 to 2 fluidrams) of iodipin 10 per cent. 3 to 4 times a day.

Manufactured by E. Merck, Darmstadt, Germany (E. Merck & Co., New York). German patent No. 96,495.
Iodipin, 10 per cent.—Iodized sesame oil, 10 per cent iodine. Iodipin 10 per cent. is an iodized sesame oil containing 10 per cent. of iodine in organic combination.
Iodipin, 25 per cent.—Iodized sesame oil, 25 per cent. iodine. Iodipin 25 per cent. is a preparation similar to the preceding, but intended for hypodermic administration.
Capsules of Iodipin, 25 per cent.—Each capsule contains Iodipin, 25 per cent. 2 Gm. (30 grains).

IODOFORMOGEN — Iodoformalbumen. — Iodoformogen is a nearly odorless mixture of iodoform and albumin.

It is prepared by precipitating a solution of albumin with alcoholic solution of iodoform and heating the precipitate at 120° C. (248° F.).

It is a very fine, voluminous, light-yellow, nearly odorless powder, non-hygroscopic and non-conglutinating. It is insoluble in water, and sterilizable at 100° C. (212° F.) without decomposition or change. It contains about 12 per cent. iodine.

Actions and Uses.—Its action is that of iodoform, which is slowly liberated when it is in contact with wound surfaces, making the action more persistent. It limits secretion, favors granulation and promotes drying.

Iodoformogen is recommended by the manufacturer as a dusting powder for ulcerated surfaces.

Dosage.—Being about three times as voluminous as iodoform, it is usually applied undiluted to the affected parts. It may be used as a snuff in ozena, mixed with an equal amount of boric acid.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany and New York. German patent No. 95,580. U. S. trademark No. 31,186.

IODO-MANGAN — Liquor Ferro-Mangani Iodopeptonati "Dieterich."—Iodo-mangan is Ferromangan Dieterich with the addition of 1 per cent. of iodopeptone.[1] Iodopeptone contains 15 per cent. of iodine.

The process of preparation is the same as that given under Ferro-Mangan "Dieterich," with the addition of a solution of iodopeptone.

Iodo-mangan is a clear dark-brown liquid of agreeable odor and taste, and a slight acid reaction.

Method of Valuation: After determination of the percentage of iron and manganese a test method should be employed, as described by Dr. Karl Dieterich in Helfenberg Annals, 1901, pages 162-165, to ascertain the percentage of halogens in Iodopeptone: About 0.5 Iodopeptone should be thoroughly mixed with a few grams of a mixture of 1 part potassium nitrate and 2 parts sodium carbonate either in a porcelain or platinum crucible. The mixture is then covered with a light layer of sodium carbonate, covered and carefully heated until reaction sets in. When finished a little potassium nitrate is added to obtain a smooth flux, then the molten mass is exposed to glowheat for about 15 minutes. After cooling it is dissolved in hot water, rinsed into a beaker, filtered if necessary, acidulated dith diluted acetic acid and any iodate reduced with sulphurous acid. The excess of acid is driven off by heat, the liquid strongly acidulated with nitric acid, again heated, until the gas formation ceases, then precipitated while hot with silver nitrate. The silver Iodide is collected on a weighed filter, washed with very dilute ammonia water, as the preparation contains hydrochloric acid, dried and weighed.

Actions and Uses.—It is claimed to be a reconstructive tonic and blood making adjuvant, with favorable action in affections of the glandular system.

Iodo-mangan is said to be useful in scrofulosis, rheumatism, etc.

Dosage.—4 to 16 Cc. (1 to 4 fluidrams), according to age, three times a day.

Manufactured by Chemische Fabrik Helfenberg A. G., near Dresden, Germany. (Reinschild Chemical Co., New York.) No patents. U. S. trademark No. 57,870.

IODONE.—Iodonum—Iodone $(C_6H_4C_2O_2)_2$ $KI.I_4$, is a periodide of phthalic acid anhydride.

Iodone is prepared by treating a solution of phthalic-acid anhydride in acetic ether, with a solution of iodine and potassium iodide, and crystallizing the product from suitable solvents.

Iodone occurs in the form of dark green prismatic crystals which melt with decomposition at 163° C. (325.4° F.). When freshly prepared it is odorless, but on standing, traces of iodine are liberated, giving it a faint odor of iodine. It is gradually decomposed into phthalic acid, iodine, and potassium iodide by water, in which the decomposition products dissolve until a saturated iodine potassium iodide solution results. Any excess of iodine remaining in contact with the supernatant liquid remains unchanged. Alcohol, chloroform, and ether decompose iodone, but more slowly than water. Iodone crystals are stable in dry air; exposed to damp air, they gradually liberate iodine.

When 0.1 Gm. iodone is heated in a crucible at not more than a dull red heat, the compound chars, iodine vapor is driven off, and a residue of white potassium iodide remains. At a bright red heat the latter is dissipated, leaving no weighable residue (absence of metallic impurities).

About 0.1 Gm. iodone, accurately weighed, is allowed to react, with occasional agitation, with a solution of 1 Gm. potassium iodid in 50 c.c. water. At the end of 15-20 minutes the titration of this solution with tenth-normal thiosulphate solution should indicate the presence of not less than 51.1 per cent. Iodine.

Iodone surgical dressing and dusting powder, assayed by the above process, should yield not less than 2 per cent. of available iodine. (About 2.5 Gm. should be taken for the assay.)

Actions and Uses.—Like iodine, iodone is a potent germicide and stimulant to the processes of repair in wounds. It is said to be useful in all conditions in which the local use of iodine is indicated.

Dosage.—Iodone is not used in substance but the employment of its preparations should be regulated on the basis of their iodine content.

Manufactured by the Henry C. Blair Co., Philadelphia, Pa. U. S. patent applied for. Not trademarked.

Iodone Oil—Oleum Iodoni.—Iodone oil is a 2 per cent. solution of iodone crystals in a mixture of alcohol, castor oil, and cotton seed oil. It is said to yield about 1 per cent. of iodine, slowly liberated on prolonged contact with moisture and to contain about 20 per cent. alcohol.

Iodone oil is prepared by dissolving iodone crystals in a mixture of alcohol and oils to which sufficient iodine has been added to overcome the decomposing effects of the solvent on iodone.

It is a clear dark reddish-brown oily liquid, having a specific gravity of about 0.912 at 25° C. (78° F.) and a faint alcohol-like odor.

When shaken with chloroform and water the chloroform acquires a violet color, which is decolorized by shaking with a solution of sodium thiosulphate.

If 5 Cc. of the oil is dissolved in 15 Cc. of chloroform and treated as under iodone ointment, considerable time being allowed during the titration for the complete liberation of the iodine (at least twenty-four hours), about 1 per cent. Iodine, calculated from the volume of volumetric sodium thiosulphate solution, should be indicated.

Actions and Uses.—Iodone oil has the germicidal and alterative actions due to the iodine which is liberated on contact with moisture.

It is said to be useful in all catarrhal affections of mucous membranes, hay fever, etc.

Dosage.—Its employment should be regulated on the basis of its liberating 1 per cent. of iodine on contact with moisture. It may be applied as a spray or on pledgets of cotton or tampons. It can be injected hypodermically into tuberculous joints, etc.

Iodone Ointment—Unguentum Iodoni.—Iodone ointment is a mixture of Iodone crystals with petrolatum, said to contain about 4 per cent. of Iodine and to yield about 2 per cent. of available Iodine slowly liberated on contact with moisture.

Iodone ointment is a dark green unctuous mass, having the consistency of petrolatum and a faint Iodine-like odor.

A small amount dissolved in chloroform in a test tube and shaken with water should impart to the chloroform a violet color, which is destroyed by addition of sodium thiosulphate solution.

If 2 to 3 Gm. of Iodone ointment be weighed and dissolved in 15 Cc. of chloroform and 30 Cc. of water added, the mixture shaken frequently during one hour, and titrated with tenth normal sodium thiosulphate solution using starch as indicator, not less than 2 per cent. of Iodine should be indicated.

Actions and Uses.—Iodone ointment has germicidal, alterative and stimulant powers due to the Iodine liberated.

It is said to be useful in all conditions in which the local use of Iodine in ointment is indicated.

Dosage.—Its employment should be regulated on the basis of the liberation of 2 per cent. of available Iodine on contact with moisture.

Iodone Surgical Dressing and Dusting Powder—Pulvis Iodoni Compositus.—Iodone surgical dressing and dusting powder is a mixture of four parts of Iodone and 96 parts pure sterile talcum.

Dosage.—Its employment as a surgical dressing and dusting powder should be regulated on the basis of its containing 2 per cent. of available Iodine, slowly liberated on contact with the moisture of wound secretions, etc.

IOTHION — Di-Iodo-Hydroxy-Propane. — Iothion is 1,3-di-iodo-propane-2-ol $CH_2I.CHOH.CH_2I = C_3H_6OI_2$.

Dichlorhydrin, obtained by chlorinating glycerin, is heated with the theoretical quantity of potassium Iodide in the presence of water, chlorine being replaced by Iodine with the production of di-iodo-hydroxy-propane.

Iothion is a yellowish, oily, heavy liquid, of sp. gr. 2.4 to 2.5, containing 77 per cent. of Iodine. It is volatile at the body temperature, and not unpleasantly odorous. It is insoluble in water but soluble in glycerin, oils, alcohol and other organic solvents. It is incompatible even with weak alkalies.

If Iothion be heated on the water bath under a reflux condenser for 5 to 6 hours, with 33 per cent. solution of potassium hydroxide and the Iodine liberated from the residue by sulphuric acid and sodium nitrite and extracted with carbon disulphide, the titration of this Iodine carbon disulphide solution with sodium thiosulphate in the usual way, should indicate 77 per cent. of Iodine.

Actions and Uses.—Iothion acts like Iodine and the Iodides, but it is said to be rapidly absorbed by the intact skin.

It is said to be a satisfactory substitute for Iodine and Iodides. It is applied to the surface of the body in the same manner as mercurial inunctions.

Dosage.—It is applied in the form of a 25 to 50 per cent. ointment with a mixture of equal parts of wool fat (lanolin) and petrolatum as a base.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. trademark No. 39,252.

KEFIR FUNGI—Kefir fungi is a mixture of bacteria and yeasts capable of causing lactic acid fermentation of milk.

Kefir occurs in the form of white irregular roundish bodies, of the size of a walnut, with a very rough, furrowed surface, and of a tough gelatinous consistency. The substance contains Saccharomyces cerevisiæ (Heyden), Bacillus acidi lactici (Pasteur),

1. Iodomangan formerly contained 0.45 per cent. of Iodopeptone.

Dispora Caucasica (Kern). It acts on milk as follows: Fat, salt and water of the milk remain unaffected. The lactose is gradually decreased and the lactic acid increased. Alcohol is produced along with carbon dioxide. 10 per cent. of the casein is converted into acid albumin and peptones, 10 per cent. into hemialbumose and the rest loses its lime. (U. S. Disp., 19th ed., p. 1540.)

Action and Uses.—Kefir fungi are used for the preparation of fermented milk which contains lactic acid, alcohol, the fats, salt and water of the milk. Kefir milk acts as an easily digestible food in many cases of dyspepsia and lack of digestive power. It is also serviceable in some cases in the prevention of intestinal putrefaction.

Dosage.—Kefir kumyss may be prepared by adding active kefir grains to fresh cows' milk, kept at a temperature of 21°-27° C. (70° to 80° F.) until the effect of fermentation becomes apparent by the rising of the grains to the surface. The grains may then be strained off, and the milk, which now contains sufficient yeast-cells to insure continuance of the fermentation, left to itself in well-corked bottles.

KERATIN—Keratinum.—Keratin is a proteid substance which forms the chief part of horns, hoofs, feathers, wool, etc.

To prepare keratin horn shavings are macerated for some days in a mixture of equal parts of ether and alcohol, decanting the liquid and washing the residue with warm water. The washed shavings are then treated with an acid solution of pepsin at 40° C. (104° F.). After further washing with water the residue is dried and powdered.

Keratin occurs as a brownish yellow powder or in transparent white or grayish white scales, tasteless and odorless. It is soluble in concentrated acetic acid, caustic alkalies and ammonia, but insoluble in water, alcohol, ether, dilute acetic acid or acid pepsin solutions. It is decomposed by long boiling under pressure forming a turbid solution with the liberation of hydrogen sulphide. Boiling with dilute sulphuric acid converts it to leucine, tyrosine and other products. On ignition it emits the odor of burning feathers and the remaining carbon is very difficultly burned. On complete combustion the ash should not exceed 1 per cent. 24 hours' digestion with 15 times its volume of ammonia or glacial acetic acid solution at 25°-40° C. (77°-104° F.) should not leave more than 0.3 per cent. insoluble matter.

Uses.—For coating pills to pass the stomach unchanged.

LACTOPHENIN — Lactopheninum. — Phenetidinum lactylatum (Pharm. Helvetica, edit. 4)—Lactylparaphenetidin.—Lactophenin is lactylparaphenetidin. $C_6H_4.OC_2H_5.NH(CH_3.CHOH.CO{=}C_{13}H_{19}NO_3$, a phenetidin derivative differing from acetphenetidine (Phenacetin) in that the acetic-acid radicle of acetphenetidine is replaced by the lactic-acid radicle (lactyl).

It is prepared by heating lactic acid and paraphenetidin, in molecular proportions, at 180° C. (356° F.) until all the liberated water is expelled and crystallizing the product from hot water.

Lactophenin occurs as a white, crystalline, odorless powder, of slightly bitter taste and neutral reaction. It melts at 117.5° to 118° C. (243.5° to 244.4° F.). It is rather difficultly soluble in cold water (1:330), and is soluble in 55 parts of boiling water. It is soluble in 8.5 parts of alcohol, and is not precipitated from this solution by water. In ether and petroleum it is difficultly soluble.

On boiling 0.2 Gm. of lactophenin with 2 Cc. hydrochloric acid for one minute, then diluting the solution with 20 Cc. water, and filtering when cold, the filtrate will become colored a ruby red on the addition of chromic acid solution.

On dissolving 0.1 Gm. lactophenin in 10 Cc. hot water, and filtering when cold, the filtrate, on the addition of bromin water, should afford a decided turbidity which disappears on the addition of much water.

The aqueous solution of lactophenin must not have an acid reaction.

No blue coloration should develop on adding potassium dichromate solution to the cold aqueous solution of lactophenin (absence of phenetidin salts).

Lactophenin should dissolve in concentrated sulphuric acid in the cold without coloration (absence of foreign organic mixtures), and on incineration should leave no weighable residue (absence of inorganic admixtures).

Actions and Uses.—Lactophenin is an antipyretic and analgesic similar to acetphenetidin (phenacetin). It is claimed that it has a more marked action as a hypnotic than acetphenetidin (phenacetin) and that at the same time respiration and circulation remain unchanged. It is also claimed that the lactic acid constituent is more easily separated from the compound than is the case with the acetic acid radicle of acetphenetidin. It is stated that the preparation is absorbed from the stomach to a large extent, so that the activity of the doses given reaches its maximum in a short time.

The therapeutic indications of lactophenin are similar to those of acetphenetidin (phenacetin). It is claimed by the manufacturers to be particularly valuable in the treatment of typhoid fever on account of its combined antipyretic and sedative properties. On the other hand, it is the general opinion that antipyretics should not be used in the treatment of typhoid fever unless under very exceptional circumstances. In the opinion of good authorities the action and uses of lactophenin do not materially differ from those of acetphenetidin (phenacetin).

Dosage.—The initial dose is 0.5 Gm. (8 grains) for adults and the maximum daily dose 3 to 5 Gm. (45 to 75 grains).

Manufactured by C. F. Boehringer & Soehne, Waldhof near Mannheim, Germany (Merck & Co., New York). U. S. patent No. 503,743 (expired). U. S. trademark No. 24,643.

LECITHIN PREPARATIONS

LECITHIN.—Lecithin consists of the esters of oleic, stearic, palmitic or other fatty acid with glycerophosphoric acid combined with cholin; occurring in combination with proteids in many animal and vegetable tissues, especially in nervous matter and egg-yolk.

Lecithin is best prepared from egg-yolk (in which it exists as vitellin) by dissolving out the lecithin by strong alcohol.

It is a yellowish-brown, waxy solid of peculiar odor, soluble in an equal volume of cold absolute alcohol, readily soluble in chloroform, petroleum, benzin, and fats, less readily in ether. It is insoluble in water, but swells, giving the peculiar "myeline forms," and decomposes on prolonged contact. It is hygroscopic on exposure to air.

The alcoholic solution is precipitated by platinum or cadmium chloride. It is decomposed by alkalies with the formation of cholin and trimethylamine. The ash contains phosphoric acid. The different lecithins contain from 3.84 to 4.12 per cent. of phosphorus and 1.73 to 1.86 per cent. of nitrogen. The ratio of nitrogen to phosphorus should be as 1 to 2.21.

Lecithin is incompatible with alkalies; it should be kept in well-stoppered bottles and should be protected from the light.

Actions and Uses.—Lecithin is supposed to act as a stimulant to nutrition and not as a direct nutrient, and to increase the number of the red blood corpuscles and the amount of hemoglobin. Some investigators state that there is a slight increase in the proportion of large mononuclear leukocytes, that the appetite is improved, that there is a retention of nitrogen and a diminution in the excretion of phosphoric and sulphuric acids, indicating a storage of proteids, and that uric acid is perhaps slightly diminished. Lecithin, even in large doses, is not toxic. (See note under Creosote Carbonate.)

The ordinary diet contains from 5 to 15 Gm. (75 to 225 grains), and some observers claim that the benefits of the administration of lecithin can be obtained by an increased use of lecithin-containing food (eggs, etc.), but others claim that the raw or combined lecithin is ineffective.

Dosage.—It may be given by mouth in doses of 0.1 to 0.5 Gm. (1.5 to 8 grains) per day, in pill form, before meals, or, hypodermically 1 Cc. (15 minims) of a 5 per cent. solution in oil, daily. Infants, one-third of these doses.

GLYCEROLE OF LECITHIN—Glyceritum Lecithini.—Glycerole of lecithin is a solution of lecithin in pure glycerin, containing in each 100 Cc., 1.6 Gm. of pure lecithin.

Actions and Uses.—See Lecithin.

Dosage.—4 Cc. (1 fluidram) containing 0.06 Gm. (1 grain) of lecithin.

Manufactured by Fairchild Bros. & Foster, New York. Not patented or trademarked.

LECIBRIN.—Lecibrin is lecithin from the brain in combination with nucleoproteins, containing 33⅓ per cent. by weight of lecithin.

Lecibrin is put up in gelatin coated "pepules," each containing 0.2 Gm. (3 grains), the equivalent of 0.0027 Gm. (1/25 grain) of elementary phosphorus.

Actions and Uses.—See Lecithin. Said to be better borne than lecithin in some cases.

Dosage.—One to three pepules.

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark No. 50,967.

LECITHIN SOLUTION.—A solution of lecithin containing 1.6 Gm. of lecithin in 100 Cc. of a glycerin-alcoholic menstruum containing 12.5 per cent. of alcohol by volume.

Actions and Uses.—See Lecithin.

Dosage.—4 Cc. (1 fluidram), containing 0.06 Gm. (1 grain) of lecithin.

Manufactured by Fairchild Bros. & Foster, New York. Not patented or trademarked.

LECITHOL.—An emulsion-like solution of lecithin containing 18 per cent. of absolute alcohol by volume, and .06 Gm. (1 grain) of lecithin per 4 Cc. (1 fluidram).

The lecithin is separated from hogs' brains.

An opalescent yellow liquid of pleasant taste and odor.

Test: From lecithol, 10 Cc., the alcohol is removed by evaporating on the water-bath; then water, 90 Cc., is added. Next concentrated hydrochloric acid, 2 Cc. is added, and then, with thorough shaking, gradually 2 Cc. chloroform. The liquid precipitate which separates out, containing nearly all the lecithin, is collected and treated with strong sulphuric acid and fuming nitric acid. After all the organic matter is decomposed, the phosphorus is determined in the usual way. From this the percentage of lecithin is calculated.

Actions and Uses.—See Lecithin.

Dosage.—4 to 8 Cc. (1 to 2 fluidrams) immediately before or after meals.

Manufactured by Armour & Co., Chicago.

NEURO-LECITHIN-Abbott.—Neuro-lecithin-Abbott is a preparation of lecithin with small amounts of fats and cholesterin, the amount of lecithin being determined by assay.

Neuro-lecithin is said to be made from the brain and spinal cord of animals. The water and fat are separated by heat; the soluble portions are extracted from the residue with ether; this is precipitated with acetone.

For properties and tests see Lecithin. The amount of lecithin is determined by a quantitative estimation of phosphorus and nitrogen. The material is exhausted with ether-alcohol at the boiling point of the mixture, the solution evaporated, the residue fused with sodium carbonate and potassium nitrate and phosphorus determined in the fusion. The amount of phosphorus found multiplied by 26 (806/31) is taken to indicate the amount of lecithin.

Actions, Uses and Dosage.—See Lecithin.

Manufactured by the Abbott Alkaloidal Co., Chicago. U. S. trademark No. 65,384.

Neuro-Lecithin Tablets-Abbott.—Each tablet contains neuro-lecithin 0.03 Gm. (½ grain).

Neuro-Lecithin Pills-Abbott.—Each pill contains neuro-lecithin 0.03 Gm. (½ grain).

LENIGALLOL—Pyrogallol Triacetas.—Triacetylpyrogallol. Lenigallol is pyrogallol triacetate, $C_6H_3(CH_3CO_2)_3 = C_{12}H_{12}O_6$, obtained by replacing the hydroxyl groups of pyrogallol with acetyl groups.

It is prepared by boiling 10 parts of pyrogallol, 1 part of sodium acetate, and 25 parts of acetic anhydride for 2 hours, and washing the crystalline product on a filter with water.

It is a white, crystalline powder, melting at 165° C. (329° F.). It is insoluble in water, but soluble with decomposition in warm aqueous alkalies.

It is incompatible with alkalies, strong acids and oxidizing agents.

Actions and Uses.—Lenigallol is said to be non-poisonous and non-irritating, but a mild and painless corrosive. (See note under Creosote Carbonate.)

It is introduced as a substitute for pyrogallol in psoriasis, lupus, acute and subacute eczema of children and other skin diseases.

Dosage.—In 5 to 10 per cent. ointment with zinc oxide.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany. German patent No. 105,240.

LYSIDIN.—Lysidin is a 50 per cent. solution of ethylene-ethenyl-amidine, $\begin{matrix} CH_2.N \\ | \\ CH_2.N\,H \end{matrix} \!\!> C.CH_3 = C_4H_8N_2$, a monatomic base derived from ethylene diamine.

It is prepared by subjecting ethylenediamine hydrochloride and sodium acetate to dry distillation, decomposing the hydrochloride of the new base with concentrated potassium hydroxide and crystallizing.

It forms small, colorless, very hygroscopic needles, melting at 105° to 106° C. (221° to 222.8° F.). It is very soluble in water and in alcohol forming alkaline solutions; it is also soluble in chloroform, but insoluble in ether. It forms a very soluble salt with uric acid.

It should form a clear and colorless solution and give the usual alkaloidal reactions.

Being a strong base it is incompatible with acids and with the salts of many metals and of the alkaloids, which it decomposes.

Actions and Uses.—Lysidin is said to be a diuretic and is recommended as a uric acid solvent on the theory that, because it forms a very soluble salt with uric acid, it will facilitate the elimination of that substance. It is claimed that it is superior to piperazine.

It is said to be useful in gout, lithiasis and the various forms of the so-called uric acid diathesis.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York).

MASSOLIN—Cultura Bacilli Bulgarici-Lederle.—Massolin is a pure culture of the *Bacillus bulgaricus* of Massol, grown on one of the following media: Calcium carbonate lactose broth, calcium carbonate dextrose broth, calcium carbonate Cohendy broth, or Cohendy broth.

The material for one of the above broths is sterilized for thirty minutes on three successive days and then placed in the incubator for at least forty-eight hours to determine its sterility before using. The material is then put into large flasks, inoculated from test tube cultures of the bacillus and incubated at 37° C. (98.5° F.) for from twenty-four to ninety-six hours. It is then tested to see that it is free from contaminating organisms.

The preparation is of an amber color and has the odor and taste of the particular medium employed as its base.

The material should be inoculated into milk and into the above media in test tubes and smeared on Cohendy agar. The cultures should be examined microscopically for the detection of contaminating organisms.

Actions and Uses.—The culture tends to prevent the growth of putrefactive and pathogenic organisms. It is said to be useful in the treatment of suppurative conditions and is said to have been found especially beneficial in atrophic rhinitis, chronic nasal catarrh, inflammations of the frontal sinus, antrum, ethmoidal cells, middle ear, etc.

Dosage.—The culture should be liberally applied directly to the diseased area and in ordinary nose and throat affections the contents of one bottle, 7.5 Gm. (¼ ounce) may be employed at each treatment.

Manufactured by Lederle Antitoxin Laboratories, New York (Schieffelin & Co., New York).

No patent or trademark. U. S. Government License No. 17.

MEDICINAL FOODS

The so-called "Liquid Foods," "Medicinal Foods" or "Predigested Foods," as found on the market, are solutions containing as the essential constituents small amounts of protein substances and carbohydrates, preserved by alcohol.

The protein substances should be rendered soluble, i. e., converted to peptones and proteoses, by means of enzymes. While the hydrolysis of proteids to soluble proteoses may also be effected by means of acids or superheated steam, these products should be excluded from medicinal foods because of the uncertainty as to their composition and behavior—being held toxic and dangerous by some. The protein content of these liquid medicinal foods (obtained by multiplying the total nitrogen content by 6.25) ranges from 0.5 to more than 6 per cent. The carbohydrates present in these foods are sucrose (cane sugar), maltose, glucose, invert sugar, dextrin and possibly also lactose (milk sugar). In these foods, as found on the market, the quantity of carbohydrates ranges from 0.55 to more than 15 per cent. The alcohol content varies from 12.0 to 19 per cent. of absolute alcohol by weight. Some contain large amounts of glycerin.

Actions and Uses.—The value of medicinal foods depends on the proteins and carbohydrates contained therein. Glycerin does not, so far as known at present, possess any recognized food value, although there are a number of experiments on record to indicate that it influences metabolism. While the value of alcohol in the treatment of disease is fully appreciated, its value as a food product, pure and simple, in disease is an open question. It probably acts as a saver of fat and carbohydrate, but not as a tissue builder. The nutritive value of these medicinal foods, therefore, should be considered as based on their carbohydrate and protein content, exclusive of alcohol or glycerin. The calculated food value of a considerable number of medicinal foods, on the basis of the potential energy (calorific value) due to proteins and carbohydrates shows that some possess but one-sixth the value of milk, while the best have a trifle greater calorific value. The Council has decided that no liquid medicinal or predigested food be given consideration which contains less nutritive value, exclusive of alcohol and glycerin, than milk; and at least one-fourth of this should reside in nitrogenous constituents.

Dosage.—None of the commercial liquid medicinal or predigested foods contains sufficient food material to maintain normal nutrition. A man doing moderate work requires an amount of food which furnishes energy to 3,000 calories per day, and while, in sickness, this amount is not required, it should not fall much below 1,500 calories per twenty-four

hours. The examination of commercial liquid food shows that the average daily dose recommended supplies from 10 to 111 calories based on protein and carbohydrate. To sustain the vitality of a patient during a serious illness, 2,000 Cc. of milk, giving about 1,430 calories, are required; to supply the same number of calories, even if the alcohol is considered to have direct food value, from 700 to 1,500 Cc. of the medicinal foods will be required. In many cases the amount of alcohol exhibited by these quantities would keep the patient in an alcoholic stupor continually. It should, therefore, be remembered that the patient is receiving a starvation diet when these preparations are given in ordinary doses. Unless the daily dose advised contains at least 100 calories, exclusive of alcohol and glycerol, a preparation should not be depended on as of noteworthy importance in helping to sustain life even for a very limited period.

DEXTROSE.—Saccharum Amylaceum.

Dextrose, $C_6H_{12}O_6 + H_2O$, is a carbohydrate prepared by the action of dilute acids on starch; it also occurs naturally.

Dextrose containing a molecule of water of crystallization occurs in white crystalline masses. It is soluble in its own weight of water at 15° C. (59° F.); in 50 parts alcohol (85 per cent.) at 17° C. (62.6° F.) and in 11 parts at the boiling temperature.

An aqueous solution (1-10) of dextrose should yield after the addition of dilute nitric acid not more than a slight turbidity with either barium nitrate or silver nitrate; and after the addition of ammonia should produce no precipitate with ammonium oxalate.

An aqueous solution (1-20) of dextrose should not change when heated with hydrogen sulphide.

Actions and Uses.—Dextrose is quite readily digested and may be used in place of cane sugar as a food.

Dosage.—180 Gms. (6 oz.) daily.

DRY PEPTONOIDS.—Dry peptonoids is stated to contain 40 per cent. of proteins and 53 per cent. of carbohydrates.

It is said to be made from beef, milk and wheat, by digesting the protein with pepsin and pancreatin and the carbohydrates with pancreatin and malt diastase. The resultant solutions are assayed, mixed in proper proportions and, the acid used in the digestion having been neutralized, concentrated *in vacuo*, sterilized, dried and brought to uniform composition by the addition of milk sugar.

It consists of light brown granules of pleasant odor and taste and is very soluble in water and other fluid media.

Actions and Uses.—See Medicinal Foods. The nutritive value of 500 Gm. of Dry Peptonoids corresponds to approximately 2,000 calories, of which 870 are due to protein and 1,130 to carbohydrates and fat. The largest dose usually given (16 Gm.) equals, therefore, almost 64 calories. It is claimed to be especially useful for nutrient enemata.

Dosage.—For an adult 8 to 16 Gm. (¼ to ½ ounce), taken in water, milk, wine, broths, soups, etc., also in gruels, in which case it should first be dissolved in a small quantity of water.

Manufactured by the Arlington Chemical Co., Yonkers, N. Y. U. S. trademark. Oct. 17, 1882.

LIQUID PEPTONOIDS.—Liquid peptonoids contain 4.5 to 5 per cent. nitrogenous matter (nitrogen x 6.25), 10.6 to 11.5 per cent. carbohydrates (glucose, lactose and sucrose) and 17.5 to 17.8 per cent. alcohol by volume (14 to 14.1 by weight).

It is said to be made from beef, milk and wheat by digesting the protein with pepsin and pancreatin and the carbohydrates with pancreatin and malt diastase.

It is a light brown fluid of aromatic taste and odor and acid in reaction. Its specific gravity is 1.047 to 1.049.

Actions and Uses.—See Medicinal Foods. The nutritive value of 500 Gm. of Liquid Peptonoids corresponds to 335 to 345.1 calories, of which 108.7 to 118.3 are due to protein and 216.7 to 236.4 to carbohydrates. The same quantity of milk represents 360 calories, of which 84 are due to protein and 98.4 to carbohydrates.

Dosage.—15 to 30 Cc. (4 to 8 fluidrams) from 3 to 6 times a day. Children in proportion.

Manufactured by the Arlington Chemical Co., Yonkers, N. Y. U. S. trademark.

LEVULOSE-Schering — Levulosum-Schering. — Fruit Sugar —Fructose.—Levulose Schering is a pure, crystallized fructose (levulose), $CH_2OH.CHOH.CHOH.CHOH.CO.CH_2OH = C_6H_{12}O_6$, absolutely free from dextrose (ordinary glucose).

It is prepared from invert sugar by precipitation as calcium salt, decomposing the precipitate with carbonic acid, and crystallizing. It is a colorless, odorless, slightly hygroscopic, crystalline powder, having a sweet taste compared with that of ordinary cane sugar (saccharose). It is readily soluble in water and in diluted alcohol, slightly soluble in alcohol, insoluble in absolute alcohol and in ether.

Its aqueous solution reduces Fehling's solution and rotates the ray of polarized light to the left.

Actions and Uses.—Levulose is in part at least metabolized in the body by other agencies than those that act on dextrose and most of the other sugars and appears to be sometimes more completely utilized by the diabetic organism than the other sugars.

It has been recommended for the nutrition and for sweetening the food and drink in suitable cases of diabetes, in pulmonary tuberculosis, infantile malnutrition and marasmus.

Dosage.—It is given in diabetes in daily quantities of 30 to 60 Gm. (1 to 2 ounces); in grave forms of the disease the amount is reduced to from 12 to 24 Gm. (3 to 6 drams) daily.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. trademark No. 21,864

NUTROSE — Sodii Caseinas. — Sodium Caseinate — Casein-Sodium.—Nutrose is a sodium salt of milk casein, containing 65 per cent. of proteids.

It is prepared by dissolving moist casein, freshly precipitated from skimmed milk and washed with water, in solution of sodium hydroxide, evaporating the solution to dryness *in vacuo*, powdering the residue, washing it successively with alcohol and ether, and drying.

It is a coarse, white, odorless and tasteless powder, forming a turbid, adhesive solution with water, having an alkaline reaction toward litmus, but being acid toward phenolphthalein.

Incinerated on platinum foil, it evolves vapors similar in odor to burning horn and leaves at least 3 per cent. of a white, nonvolatile residue, which has an alkaline reaction and colors the Bunsen flame yellow. Casein can be detected by the biuret reaction.

It is incompatible with acids.

Actions and Uses.—Nutrose has been recommended as a nonirritant nutrient in wasting diseases, such as the cachexias in carcinoma, anemia, diabetes, etc., and in acute and chronic febrile ailments, such as pneumonia, typhoid fever and tuberculosis.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). German patent No. 85,057.

PANOPEPTON.—Panopepton contains 6.33 to 6.38 per cent. of nitrogenous matter (nitrogen x 6.25), 10.05 to 11.92 per cent. of carbohydrates and 17 to 20.9 per cent. alcohol by volume (15 to 18.5 per cent. by weight).

It is said to be prepared from beef and wheat by digestion with gastric and pancreatic juices. The substance obtained by the digestion is mixed in fixed proportion of protein and carbohydrate, sterilized, concentrated *in vacuo* and dissolved in fortified Spanish sherry wine.

It is a light brown fluid, acid in reaction and possessing largely the odor and taste of sherry wine. Its specific gravity is 1.063 to 1.023.

Actions and Uses.—See Medicinal Foods. The nutritive value of 500 Gm. of Panopepton corresponds to 359.1 to 396.3 calories, of which 151.9 to 153.1 are due to protein and 244.4 to 206 to carbohydrates. The same quantity of milk represents 360 calories, of which 84 are due to protein and 98.4 to carbohydrates.

Dosage.—8 to 16 Cc. (2 to 4 fluidrams) several times a day and at bedtime; for infants from a few drops to 2 Cc. (30 minims).

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark.

PEPTONE—Peptonum.—Peptonum (Pharm. Belgica., edit. 3); Peptona Medicinalia (Pharm. Française, 1908).

Peptone is a product of the peptic or pancreatic digestion of albuminoid substances.

Peptone may be produced artificially as follows: Mince 1000 parts of lean beef freed from bone, etc., and mix it with 4000 parts of water, to this add a solution of 5 parts of pepsin in 1000 parts of water with 50 or 25 parts of hydrochloric acid. The mixture thus prepared is kept at a temperature not exceeding 50° C. (122° F.) until 10 Cc. of the filtrate or the addition of 1.5 Cc. of nitric acid in the cold no longer produces a precipitate. (Formation of a coagulum indicates incomplete peptonization.) The solution is then filtered, neutralized with sodium bicarbonate and evaporated to dryness *in vacuo*. It may be purified if necessary from adherent sodium chloride by dialysis or by precipitation by alcohol washing with ether and drying. By desiccating its concentrated solution upon plates peptone may be obtained in scales. **(Brit. Codex.)**

Peptone occurs as a white or yellowish-brown amorphous powder or in scales, with a somewhat cheesy but not unpleasant taste and nearly odorless. The pure substances when added to water hisses and froths at the same time evolving heat. It is soluble in water (1 in 20) forming a neutral solution or slightly acid. Aqueous solutions are pale yellow and clear or may be made quite clear by the addition of a little hydrochloric acid. The addition of alcohol precipitates peptone. Aqueous solutions are not coagulated by heat. No precipitate is formed in aqueous solution on the addition of nitric acid or potassium ferrocyanide (difference from albumen) nor is a precipitate formed by solutions of ferric chloride or cupric sulphate nor by saturation with ammonium sulphate or zinc sulphate (distinction from albumoses). The aqueous solutions are levarotatory. Neutral solutions are precipitated by tannin and by various salts of mercury. Acid solutions give precipitates with bismuth potassium iodide, potassium mercuric iodide, bromine water and other precipitants of alkaloids. Peptone is colored yellow with Millon's reagent on warming a red color and precipitate; with cupric sulphate and caustic alkali a violet red color (biuret reaction). Picric acid gives yellow flakes. Peptone should not be precipitated by lead acetate, alum or hydrogen sulphide. On ignition it should not yield more than 2 per cent. ash.

Action and Uses.—**Peptone is given as a nutrient in malnutrition and certain forms of dyspepsia. Its value is limited because larger amounts, often even small quantities, cause irritation.**

Dosage.—**Peptone is given in the form of pastilles, 5 Gm. in each prepared with gelatine. It is administered in rectal alimentation in the form of suppositories or it may be added to rectal enemata.**

MERCURIC BENZOATE—Hydrargyri Benzoas.—Hydrargyrum benzoicum (Pharm. Française, 1908), Mercuric Benzoate, $Hg(C_6H_5COO)_2+H_2O$, is the mercuric salt of benzoic acid.

10 Gm. glacial acetic acid is diluted with 100 Cc. water and 10 Gm. yellow mercuric oxide added and the mixture agitated until solution is effected. 14 Gm. sodium benzoate is dissolved in 100 Cc. water and added to the mercury solution. The precipitate which forms is collected and washed with water till free from acid and dried at 100° C. (212° F.). (Pharm. Française, 1908).

Mercuric benzoate is a white crystalline powder, slightly soluble in water, yielding a weakly acid solution, but insoluble in alcohol or ether. At 20° C. (68° F.) a 10 per cent. solution of sodium benzoate dissolves 1 per cent. of its weight of mercuric benzoate. Heated with alcohol it is decomposed into a basic salt of a yellow color. (Pharm. Française, 1908).

A solution of 1 Gm. mercuric benzoate and 0.5 Gm. sodium chloride in 20 Cc. water yield a black precipitate with hydrogen sulphide and with ferric chloride solution it yields a fawn colored precipitate of ferric benzoate.

A solution produced by shaking 1 Gm. mercuric benzoate with 20 Cc. water should not produce more than a faint turbidity when added to silver nitrate solution, acidified with nitric acid (limit of chloride). 2 Cc. of a similar solution when mixed with ferrous sulphate solution and then concentrated sulphuric acid added so as to form a layer beneath, should produce no brown coloration tu the zone of contact of the two solutions (absence of nitrates).

Action and Uses.—The same as mercuric chloride.

Dosage.—Mercuric benzoate has been recommended for hypodermic use and in gonorrhea. In urethral cases the solution may be 1-2000 or 1-1000 with an equal quantity of sodium chloride. For hypodermic injection the following may be given: Mercury benzoate, 0.02 to 0.03 Gm.; sodium chloride, 0.01 Gm.; cocaine hydrochloride, 0.15 Gm.; distilled water, 40 Cc.

MERCURIC CYANIDE—Hydrargyri Cyanidum.—Hydrargyrum cyanatum (Pharm. Française, 1908).

Mercuric cyanide, Hg (CN)$_2$, is the mercuric salt of hydrocyanic acid.

Prussian blue and mercuric oxide in water are boiled until the mixture is brown; the mixture is filtered, acidified with hydrocyanic acid, evaporated and allowed to crystallize in a cool place. It is also prepared by the action of hydrocyanic acid on mercuric chloride. Colorless or white, prismatic crystals, odorless, and having a bitter, metallic taste (the salt is exceedingly poisonous). It is darkened on exposure to light. Soluble at 15° C. (59° F.) in 12.8 parts of water, and in 15 parts of alcohol; in 3 parts of boiling water, and in 6 parts of boiling alcohol; very sparingly soluble in ether.

When slowly heated in a glass tube, the salt decrepitates, and decomposes into metallic mercury and inflammable cyanogen gas, which burns with a purple flame. On further heating, the blackish residue, consisting of para-cyanogen with globules of metallic mercury, is wholly dissipated.

If 1 part of the salt be gently heated with 1 part of iodine in a dry test-tube, it will produce at first a yellow sublimate which afterwards becomes red, and above this a sublimate of colorless, needle-shaped crystals.

On adding hydrochloric acid to the aqueous solution of the salt, the odor of hydrocyanic acid is evolved.

A 5 per cent. aqueous solution of the salt should be neutral to litmus paper, and should not yield, on the gradual addition of a few drops of potassium iodide test solution, either a red or a reddish precipitate, soluble in an excess of the precipitant, nor should it yield a white precipitate with silver nitrate test solution (absence of mercuric chloride).

If mercuric cyanide be dissolved in an aqueous solution of sodium chloride the addition of phenolphthalein to this solution should produce no red coloration (absence of mercuric oxide).

Ammonia should not color an aqueous solution blue (absence of copper) nor should a solution of copper give a brown color or precipitate (absence of potassium ferrocyanide). The presence of large quantities of potassium sulphate may be demonstrated by igniting, leaching the ash and testing the filtrate with barium. Dilute sulphuric acid should not liberate hydrocyanic acid (absence of potassium cyanide). Ammonia should dissolve mercuric cyanide without producing a white precipitate (absence of oxycyanide). (Pharm. Française, 1908).

Action and Uses.—**Mercuric Cyanide has been reported to be as actively antiseptic as mercuric chloride and to be less irritating; but this has been questioned. It is used locally and internally like mercuric chloride.**

Dosage.—**Internally from 0.004 to 0.008 Gm. (1/16 to 1/8 grain); locally, solutions of 1-4000 to 1-2000 may be used for applications to the eye or mucous membranes; 25 to 35 minims of a 1 per cent. solution may be used hypodermically without causing local irritation. Death has occurred from the use of a vaginal injection containing 0.9 Gm. (14 grains) of mercuric cyanide.**

In diphtheria and croup it is used in 0.01 per cent. solution as a gargle or internally in doses of 0.0005 Gm. to 0.001 Gm. (0.0077 to 0.0154 grain). In rhinitis fibrinosa it is used on a tampon in 0.04 per cent. solution.

MERCURIC OXYCYANIDE—Hydrargyri oxycyanidum.—Hydrargyrum oxycyanatum (Pharm. Helvetica, edit. 4).

Mercuric oxycyanide, $Hg(CN)_2HgO$, is basic-mercuric cyanide.

22.2 Gm. mercuric oxide is triturated with 52 Cc. water and 12 Cc. of sodium hydroxide solution (U. S. P.) and then 27 Gm. of pulverized mercuric cyanide is added and the mixture triturated until it becomes colorless or nearly so. If the product is not entirely decolorized heating on a water bath for a short time will complete the reaction. The mixture is allowed to settle, the liquid portion decanted off and the solid residue recrystallized from hot water or is simply washed several times with cold water, collected and dried between filter papers. (Rupp and Goy, Arch. d. Pharm., 1908, p. 369.)

Mercuric oxycyanide occurs as a white, or nearly white, microcrystalline powder which colors moist litmus paper blue. It is soluble in 17 parts water.

Boiled with a mixture of sodium hydroxide, ferrous sulphate and ferric chloride solutions, cooled and then treated with hydrochloric acid, mercuric oxycyanide yields a blue precipitate. A 1 to 20 solution gives a white precipitate with ammonia water soluble in excess of the precipitant. Tannic acid solution gives a yellow precipitate. Stannous chloride produces a grey-black precipitate. Hydrogen sulphide and ammonium sulphide produce a black precipitate. When potassium iodide is added to a solution of mercuric oxycyanide until it becomes yellow the addition of ammonia produces a red color which finally becomes a brown precipitate, which dissolves to a colorless solution in potassium iodide. An aqueous solution should not give a test for chloride nor should 0.2 Gm. leave a weighable residue when ignited. (Pharm. Helvetica, edit. 4.)

1 Gm. of mercuric oxycyanide digested with 1 Gm. sodium chloride in 20 Cc. water yields a solution which should require not less than 37 Cc. of tenth normal hydrochloric acid for neutralization, methyl orange or paranitrophenol indicator being used.

Action and Uses.—Mercuric oxycyanide is recommended as a substitute for mercuric chloride. Its antiseptic power is said to be greater and it is claimed to be less irritating than mercuric chloride, because it does not act on albumin to the same extent. It has the advantage over the chloride that it does not corrode steel instruments.

Dosage.—It may be given by hypodermic injections in the same doses as mercuric chloride or may be applied locally in solution, 1-5,000 or slightly stronger.

MERCURIC SALICYLATE—Hydrargyri Salicylas.—Hydrargyrum salicylicum (Pharm. Germanica, edit. 4; Pharm. Helvetica, edit. 4).

Mercuric salicylate, $Hg.C_6H_4.OCOO$, is a mercuric salt of salicylic acid in which one atom of mercury has combined with one molecule of salicylic acid by replacing the hydrogen atoms of the phenolic hydroxyl and carboxyl groups.

Mercuric salicylate may be prepared by precipitating the mercuric oxide from 27 parts of mercuric chloride as directed in the case of Hydrargyri Oxidum Flavum, washing, placing in a flask with a little water and 15 parts of salicylic acid, and heating on a water-bath with agitation until the mixture is perfectly white. Collect the precipitate, wash until free from acid, dry at 30° to 40° C. (86°-104° F.), and finally at 100° C. (212° F.).

Mercuric salicylate occurs as a white amorphous powder, tasteless, odorless and neutral to litmus paper, slightly soluble in water or alcohol, but soluble at the ordinary temperature in solutions of sodium hydroxide and sodium carbonate with formation of a double salt. From these solutions it is reprecipitated by acids. It is soluble also in warm solutions of chlorides, bromides

and iodides. On ignition it is entirely volatilized. Strong mineral acids decompose it, especially on heating, and after this decomposition hydrogen sulphide precipitates black mercuric sulphide from the solution.

When shaken with water the resulting solution gives a violet coloration with ferric chloride.

An aqueous solution of mercuric salicylate is not precipitated or colored immediately by hydrogen sulphide or ammonium sulphide.

0.1 Gm. of mercuric salicylate heated in a small tube with a small crystal of iodine produces the characteristic orange to red colored mercuric iodide (Pharm. Germanica, edit. 4). 0.3 Gm. mercuric salicylate mixed with about 3 Gm. sodium chloride and dissolved in 100 Cc. boiling water should upon diluting to 400 Cc., acidifying with hydrochloric acid and passing hydrogen sulphide, yield 0.2 Gm. mercuric sulphide.

Action and Uses.—Antiseptic and antisyphilitic. It has been stated that it is well tolerated by the stomach and that it does not produce salivation, but it may produce some gastrointestinal irritation occasionally, even when used hypodermically. The lack of salivation is probably due to its insolubility and slow absorption and not to any peculiarity of its effects. It is used as a disinfectant and as a remedy in syphilis and in certain skin diseases.

Dosage.—0.003 to 0.008 Gm. (1/20-1/8 grain). For hypodermic injections a suspension in liquid paraffin, one part in 10, is used; before injecting the mixture must be well shaken in order that the insoluble salt may not remain at the bottom. The needle and syringe should be thoroughly cleansed after each injection, as the insoluble drug readily clogs the instrument. At first, 0.65 Cc. (10 minims) of the mixture described should be injected deeply into the gluteal region every fourth day and this may be increased to every second day if no symptomatic evidences of the action of the drug appear. It is used in the form of dusting powder and ointment (1 in 10). A suspension in a mucilaginous vehicle (1 in 300) is used as an injection in gonorrhea, 1 Cc. (15 minims) being injected at a time. As a disinfectant the salicylate is as powerful as mercuric chloride, its great drawback being its insolubility; in order to overcome this difficulty the following formula has been devised: Mercuric chloride, 1 part; sodium salicylate, 3 parts; dissolved in distilled water, 100 parts.

MERCURIC SUCCINIMIDE—Hydrargyri Succinimidum.—Mercury succinimide $(Hg(CH_2.CO)_2N)_2{=}HgC_8H_8O_4N_2$, is the mercuric salt of succinic acid-imide, $\begin{matrix} CH_2.CO \\ | \\ CH_2.CO \end{matrix}\!\!>\!NH$

Mercury Succinimide may be prepared by dissolving freshly precipitated mercuric oxide in warm aqueous solution of succinimide and evaporating the mixture, which then deposits crystalline needles. (Schmidt's Pharm. Chemie, vol. II, pt. I, p. 482.) It may also be prepared by adding an alcoholic solution of succinimide containing a few drops of ammonia to an ethereal solution of mercuric chloride (Proceedings A. Ph. A., vol. 40, p. 1029).

Mercury succinimide is a white crystalline powder, soluble in 25 parts hot water and in 75 parts of cold water, and in 300 parts of alcohol. It is very stable in solution. The aqueous solution is not affected by albumin. Mercury succinimide should be protected from light. Toward hydrogen sulphide and potassium iodide it reacts as an inorganic mercuric compound. Addition of sodium hydroxide to an aqueous solution of mercuric succinimide produces a yellowish-white precipitate, which on heating is reduced to metallic mercury. If mercuric succinimide is heated with five times its bulk of zinc dust, pyrrol is given off, which may be recognized by the red color which is developed when a pine shaving moistened with hydrochloric acid is held in its vapors.

The aqueous solution must be neutral and should not be affected by solutions of silver nitrate or egg albumin (absence of mercuric chloride and other mercuric salts).

On ignition it should volatilize completely, leaving no residue. If one gram is shaken with 10 Cc. of dry ether, the liquid filtered and the ether removed by evaporation, no residue should remain. If one gram is suspended in ether and hydrogen sulphide passed through the mixture for some time, the mercury succinimide will be decomposed, the mercury being precipitated as mercuric sulphide. If the ether be filtered from this precipitate, and evaporated, a residue of succinimide will remain which should have a melting point of 124-125° C.

Actions and Uses.—Mercuric succinimide has the action of other salts of mercury, but its solutions are said to be non-irritating. This preparation is used like other compounds of mercury in the treatment of syphilis.

Dosage.—Mercuric succinimide is used mainly by hypodermic injection, a 2.5 per cent. solution being employed. From ½ to 1 Cc. (8 to 16 minims) of this solution may be injected once daily. Mercuric succinimide may be given by the mouth in doses of 0.01 to 0.015 gm. (1/6 to 1/4 grain).

Non-Proprietary Preparations:

Tabloid Mercury Succinimide (Hypodermic) 1/5 grain: Each tablet contains mercuric succinimide 0.013 Gm. (1/5 grain). Prepared by Burroughs-Wellcome & Co., London and New York.

Hypodermic Tablets Mercuric Succinimide, 1/5 grain: Each tablet contains mercuric succinimide 0.013 Gm. (1/5 grain). Prepared by Sharpe & Dohme, Baltimore Md.

Hypodermic Tablets Mercuric Succinimide, 1/10 grain: Each tablet contains mercuric succinimide 0.006 Gm. (1/10 grain). Prepared by Sharpe & Dohme, Baltimore Md.

MERCUROL—Hydrargyri Nucleinas.—Mercury Nucleinate.—Mercurol is an organic compound of mercury with nucleinic acid from yeast, containing 10 per cent. of metallic mercury.

It is prepared by adding a solution of mercuric chloride to an alkaline solution of nuclein, containing an excess of alkali, precipitating the resulting nucleinate of mercury by the addition of alcohol and a concentrated solution of a neutral salt (sodium chloride), separating the precipitate, washing and drying it.

It is a brownish-white powder, soluble in water, especially in warm water, insoluble in alcohol. Its watery solution has a distinct metallic taste, a weak alkaline reaction, and is not precipitated by alkalies, nor by albuminous liquids.

The mercury in this preparation resists the action of hydrogen sulphide to a marked degree.

Actions and Uses.—Mercurol does not coagulate albumin; it has marked bactericidal power and possesses the pharmacologic action of soluble mercury compounds.

It is recommended as a local antiseptic application and as an antisyphilitic remedy.

Dosage.—0.3 to 0.12 Gm. (½ to 2 grains).

Manufactured by Parke, Davis & Co., Detroit, Mich. U. S. patent No. 637,355 (Nov. 21, 1899; expires 1916).

MERGAL.—Mergal is a mixture of 1 part of mercuric cholate and 2 parts of albumin tannate put up in capsules. Each capsule said to contain approximately 0.15 Gm. (2¼ grains) of mergal equivalent to 0.05 Gm. (¾ grain) mercuric cholate and 0.1 Gm. (1½ grains) albumin tannate. Mergal contains approximately 4.4 per cent. mercury.

Mercuric cholate is prepared by a patented process, mixed with albumin tannate, and inserted into gelatin capsules in the usual way.

Mergal is a yellowish white, loose, somewhat light powder, insoluble in water and alcohol and almost insoluble in solution of sodium chloride.

When 0.1 Gm. of mergal is shaken with a few drops of saturated solution of cane sugar and underlaid with concentrated sulphuric acid, a purplish red to reddish violet zone is produced.

If 0.2 Gm. of mergal is warmed on the water bath with 10 Cc. of hydrochloric acid for about fifteen minutes and the evaporated water replaced after cooling and filtering, there results a colorless or slightly yellowish solution which gives a black precipitate with solution of hydrogen sulphide. The same filtrate gives with a drop of stannous chloride solution an immediate precipitation of metallic mercury.

Mergal should leave no weighable residue on incineration.

0.2 Gm. of mergal boiled for one minute with 20 Cc. of water gives a clear filtrate which is colored dark violet on the addition of a drop of solution of ferric chloride.

0.1 Gm. of mergal when heated with a mixture of 5 Cc. of concentrated sulphuric acid and 5 Cc. of water to boiling, produces a turbid reddish solution. The filtrate after dilution with 3 to 4 parts of water and the addition of a drop of solution of copper sulphate gives on careful underlaying or on mixture with an excess of sodium hydroxide solution an evanescent violet-red color. Mergal should be protected from the light.

Actions and Uses.—Mergal is said to pass through the stomach without decomposition and to be decomposed into its constituents in the small intestine, where the mercury is quickly absorbed into the blood and excreted through the kidneys. It is said to be useful in all forms of syphilis and in the para-syphilitic affections, such as tabes and general paralysis. It is also said to be useful for the intermittent treatment according to the method of Fournier and Neisser.

Dosage.—One capsule three times a day after meals, gradually increasing to two capsules five or six times a day.

Manufactured by J. D. Riedel Aktiengesellschaft, Berlin, Germany (Riedel & Co., New York). U. S. patent No. 811,193 (Jan. 30, 1906; expires 1923). U. S. trade-mark No. 53,919.

MESOTAN—Ericin.—Mesotan is methyl-oxymethyl salicylate, $C_6H_4.OH.COO(CH_2.O.CH_3) = C_9H_{10}O_4$, an ester of salicylic acid, analogous to methyl salicylate.

It is prepared by the action of chlormethyl ether on salicylates thus; $C_6H_4.OH.COONa + CH_2Cl.O.CH_3 = NaCl + C_6H_4.OH.COO(CH_2.O.CH_3)$.

It is a clear, yellowish, faintly aromatic, oily fluid, sp. gr. 1.2 at 15° C. (60° F.) and boiling at about 162° C. (323.6° F.). It is difficultly soluble in water, but readily soluble in the usual organic solvents and miscible with oils in all proportions. Above 100° C. (212° F.) it is decomposed, yielding salicylic acid, formaldehyde and methyl alcohol and it is likewise decomposed to a certain extent by moisture in the air.

Its watery solution gives a violet color with ferric chloride and after heating or exposure to moisture it responds to the usual tests for formaldehyde. Concentrated sulphuric acid colors it red.

It should be kept in a cool place and preserved dry in well-stoppered bottles.

Actions and Uses.—The action of mesotan is similar to that of oil of wintergreen, but it is more irritating to the skin. It is said to be useful in all forms of rheumatism.

Dosage.—Being quite irritating when applied pure to the sensitive skin, it is employed diluted with an equal volume of olive oil, and without friction. Simple application to the affected part, which need not be covered, or, if so, only slightly, is said to give prompt relief.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 706,018 (Aug. 5, 1902; expires 1919).

METHYL CHLORIDE—Methyl Chloridum.—Methyl chloride, CH_3Cl, is the hydrochloric acid ester of methyl alcohol. It occurs, in the compressed state, as a colorless liquid, having an ethereal odor, and a sweet taste.

Methyl chloride is insoluble in water, more readily in alcohol, freely in ether and chloroform, and also in acetic acid. It should be neutral to litmus paper. At about —25° C. (—13° F.) it has a specific gravity of 0.991, and boils at about —21° C. (—5.8° F.). It burns in air with a greenish flame, though it is not highly inflammable. The neutral solution is not precipitated by solution of silver nitrate, nor is there any reaction with potassium iodide and starch paste. In the liquid condition it is a powerful refrigerating agent. At very low temperatures it forms with water a hydrate, $CH_3Cl,9H_2O$. It should not react alkaline to litmus (absence of ammonia and methylated ammonia—methylamine). It should not immediately form a precipitate with silver nitrate. On evaporating it should leave no residue and emit no odor of methylamine.

Action and Uses.—By its evaporation a temperature of —23° (—9.4° F.) is produced, while if evaporation be accelerated by means of a current of air a temperature of —55° (—67° F.) may easily be reached. On account of this property it is used as a local anesthetic in the form of a spray, but its use requires caution, since it is apt to produce blisters. The diluted vapor is said to be non-poisonous. Methyl chloride is said to be an efficient general anesthetic, which has practically no influence on the circulation, but fails to produce complete muscular relaxation. It is used as a general anesthetic mixed with ethyl chloride and ethyl bromide.

Dosage.—When sprayed on the skin the part should be partly protected by a thin layer of cotton wool. When used locally cotton wool soaked in liquid methyl chloride may be applied to the skin over the painful area, but care should be taken that blisters are not formed. In order to avoid this a mixture with ethyl chloride has been recommended.

MORPHINE DERIVATIVES

By the substitution of various radicles for hydrogen in morphine, substances are produced, the action of which varies somewhat from that of morphine and which possess, it is claimed, certain advantages over the parent alkaloid. Codeine is a natural substitution product of the same type. The principal derivatives of this class are methyl-morphine (codeine,) ethyl-morphine and diacetyl-morphine.

DIACETYL-MORPHINE—Morphina Acetylata.—Diacetylmorphine, $C_{17}H_{17}(C_2H_3O_2)_2NO = C_{21}H_{23}O_5N$, is a synthetic alkaloid obtained by the acetylization of morphine.

Diacetyl-morphine was first introduced under the name Heroin by the Farbenfabriken, vorm. Friedr. Bayer & Co. It may be obtained by heating morphine with acetylchloride, washing the product with water and dilute solution of sodium carbonate and crystallizing it from alcohol.

It is a white, odorless powder, having a bitter taste, an alkaline reaction and melting at 173° C. (343.4° F.). It is soluble in about 1,600 parts of water, 25 parts of alcohol, 2 parts of chloroform, 70 parts of ether and 6 parts of benzin; also soluble in 3 parts of boiling alcohol. It forms salts with acids which are soluble in water. On prolonged warming with mineral acids it is saponified, splitting off acetic acid and reforming morphine.

A solution of 1 part diacetyl-morphine in 100,000 parts of water becomes distinctly turbid on addition of solution of iodine. Its color reactions are similar to those of morphine, with the following exceptions: It does not liberate iodine from iodic acid and does not at once produce a blue coloration with potassium ferricyanide and ferric chloride. No blue color is produced by the addition of ferric chloride to a neutral solution (1 in 100) made by the careful addition of dilute sulphuric acid. Its solutions reduce potassium permanganate.

Actions and Uses.—When given in small doses Diacetylmorphine and its hydrochloride have apparently no effect on any of the vital functions except respiration, which it renders slower, the volume of the individual respirations being increased, but usually not sufficient to compensate the slowing, the result being a diminution in the total amount of air respired. In large doses it may produce dizziness, nausea and occasionally constipation, and, in poisonous amounts, twitching of the extremities, great exhaustion, and dimness of vision may be added. The temperature becomes subnormal and the pulse rapid and thready. The habit is readily formed and leads to the most deplorable results. It is said not to produce costiveness. (This is not true, according to some observers.) It is readily absorbed from mucous membranes. It lessens irritability of the respiratory center, thus allaying cough, but does not depress the respiration as much as morphine.

On withdrawing the drug from habitués there is said to be a tendency to respiratory failure which may be dangerous.

Diacetyl-morphine and its hydrochloride have been recommended chiefly for the treatment of diseases of the air passages attended with cough, difficult breathing and spasm, such as the different forms of bronchitis, pneumonia, consumption, asthma, whooping cough, laryngitis, and certain forms of hay fever. It has also been recommended as an analgesic, in the place of morphine in various painful affections.

Toxic symptoms should be treated by the administration of caffein hypodermically and of hot coffee by the stomach. To avoid respiratory failure in the treatment of diacetyl-morphine addiction, it has been suggested to substitute morphine for the diacetyl-morphine and then treat the patient for morphine addiction.

Dosage.—See Diacetyl-morphine Hydrochloride.

Proprietary Preparation:

HEROIN.—A name applied to Diacetyl-morphine, which see.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. trademark.

DIACETYL - MORPHINE HYDROCHLORIDE — Morphinæ Acetylatæ Hydrochloridum.—Diacetyl-morphine hydrochloride, $C_{17}H_{17}(C_2H_3O_2)_2NO.HCl$, is the diacetyl-morphine salt of hydrochloric acid.

It is prepared by dissolving diacetyl-morphine in dilute hydrochloric acid, concentrating the neutral solution by evaporation and crystallizing.

It is a white, crystalline, odorless powder, having a bitter taste, showing a neutral reaction with congo and melting at 230° to 231° C. (446° to 447.8° F.).

It is soluble in 2 parts of water and soluble also in alcohol, but insoluble in ether.

Its aqueous solutions are precipitated by alkaline hydroxides, the precipitate being soluble in excess of the reagent, and by alkaline carbonates. In other respects the reactions are the same as those given under diacetyl-morphine (which see).

It is incompatable with alkalies and their carbonates, tannic acid and other precipitants of alkaloids. It is decomposed by mineral acids, particularly when heated.

Actions and Uses.—See Diacetyl-morphine.

Dosage.—0.0025 to 0.005 Gm. (1/24 to 1/12 grain) to adults three to four times a day, the maximum dose being 0.01 Gm. (1/6 grain). To children it may be given in doses varying from 0.0002 to 0.001 Gm. (1/300 to 1/60 grain), according to the age. Hypodermically it may be administered in the form of a 2 per cent. solution in the same doses. It has been applied locally to the throat, to the uterus on tampons, and by suppository for painful pelvic affections generally, but there is no evidence that it produces any local anesthetic action.

Proprietary preparation:

HEROIN HYDROCHLORIDE.—A name applied to Diacetyl-morphine Hydrochloride, which see.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. trademark.

ETHYL - MORPHINE HYDROCHLORIDE — Morphinæ Æthylatæ Hydrochloridum. — Ethyl-morphine hydrochloride, $C_{17}H_{17}NO(OH)(OC_2H_5)\,HCl + H_2O = (C_{19}H_{23}O_3ClN + H_2O$, is the hydrochloride of the ethyl ester of morphine.

The product was first introduced by Merck & Co., under the trade name Dionin. It may be obtained by the action of ethyl iodide on morphine in the presence of alkali, the basic product being purified by crystallization from hot alcohol, dissolving the crystals in hydrochloric acid and crystallizing.

It is a white, microscopically crystalline powder, odorless and only slightly bitter. It is soluble in about 7 parts of water and in 2 parts of alcohol, insoluble in ether and in chloroform. It melts completely with decomposition at 125° C. (257° F.).

It gives the usual reactions for alkaloids. It is distinguished from morphine salts by its insolubility in excess of alkali, and

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by not producing an immediate blue color, but gradually developing a blue-green coloration, when its solution is added to dilute ferric chloride solution containing a fragment of potassium ferricyanide.

It is incompatible with alkalies and their carbonates and alkaloidal reagents, as potassio-mercuric iodide, tannic acid, picric acid, etc.

Actions and Uses.—It is claimed that this compound acts like morphine without producing constipation, nausea or lassitude. It is the conclusion of some good observers that it possesses no advantage over codeine. Applied to the eye, it causes a local vaso-dilation, leading to acute conjunctival edema.

Ethyl-morphine Hydrochloride is recommended to relieve pain, especially in respiratory affections, as an antispasmodic in whooping-cough, for insomnia and externally in the treatment of corneal affections, conjunctivitis, iritis, etc.

Dosage.—0.015 to 0.06 Gm. (¼ to 1 grain). Externally it is applied in 10 to 20 per cent. solutions.

Proprietary Preparation:

DIONIN.—A name applied to Ethyl-morphine-Hydrochioride, which see.

Manufactured by E. Merck, Darmstadt, Germany. (Merck & Co., New York). German patents Nos. 102,654, 107,225 and 108,075. U. S. trade-mark.

MORPHINE MECONATE.—Morphinæ Meconas.—Morphine meconate, $(C_{17}H_{19}O_3N)_2.C_7H_4O_7.5H_2O$, is the normal salt of morphine, $C_{17}H_{19}O_3N$, and meconic acid, $H_2(C_7H_2O_7)$, a dibasic acid obtained from opium.

Morphine meconate may be prepared by dissolving 10 Gm. crystallized meconic acid in 60 Cc. warm water, adding gradually 24 Gm., or sufficient crystallized morphine alkaloid to produce a neutral solution and evaporating to dryness at a temperature below 80° C. (176° F.). (Hager, 1903, vol. 2, p. 403.)

Morphine meconate occurs in minute colorless crystals or a yellowish white powder, soluble in 34 parts of water, also soluble in alcohol. It contains 66.3 per cent. anhydrous morphine.

Action, Uses and Dosage.—The same as other salts of morphine.

Non-Proprietary Preparation:

Tabloid Morphine Meconate (Hypodermic) 1/8 grain.—Each tablet contains morphine meconate 0.008 Gm. (1/8 grain). Prepared by Burroughs-Wellcome & Co., London, England, and New York.

NEUROCAINE.—Billets of Cocaine, Schieffelin.—

Each billet contains cocaine hydrochloride 0.005 Gm. (1/12 grain), without excipient. The billets are ⅛ inch long, 1/20 inch in diameter and very soluble.

Neurocaine is used for pressure anesthesia or as a local anesthetic in dental practice.

Prepared by Schieffelin & Co., New York. U. S. trademark, No. 43,837.

NOVARGAN — Argenti Proteinas. — Silver Proteinate. — Novargan is an organic silver-albumin compound containing 10 per cent. of silver.

It is a fine yellow powder, soluble in water, forming a practically neutral solution, from which it is not precipitated by sodium chloride, nor affected by the usual reagents for silver salts. Solutions must not be heated and must be protected from the light.

The solution is darkened by hydrogen sulphide or ammonium sulphide, but no precipitate is produced.

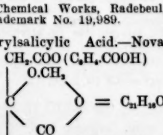
Actions and Uses.—Novargan is a bactericide; it is claimed to be more effective and less irritating than other protein-silver compounds.

It is said to be useful for the treatment of gonorrhea, especially as an abortive in the first stage.

Dosage.—0.5 Cc. (8 minims) of a 15 per cent. solution, by instillation on the anterior portion of the urethra, through a catheter 23 Cm. (9 in.) long, No. 13 French scale, as an abortive.

Manufactured by the Heyden Chemical Works, Radebeul, Germany, and Garfield, N. J. U. S. trademark No. 19,989.

NOVASPIRIN—Methylene-Citrylsalicylic Acid.—Novaspirin is methylene-citrylsalicylic acid,



$= C_{31}H_{28}O_{11}$, a compound of anhydro-methylene-citric acid (see Citarin) and salicylic acid.

Novaspirin is prepared by the action of methylene citric acid dichloride on salicylic acid.

Novaspirin is a white, odorless, crystalline powder, having a faint acidulous taste. It is easily soluble in alcohol, difficultly soluble in chloroform, ether, and scarcely soluble in water. It contains 62 per cent. of salicylic acid.

On heating with caustic alkalies salicylic acid is generated. On prolonged standing with water and more easily with alkalies it is split up into its components. When heated in a test tube it melts with the generation of formaldehyde. On adding dilute acid to the warm alkaline solution, white crystals of salicylic acid are separated.

Actions and Uses.—Novaspirin is not decomposed in the stomach and is said to be non-irritating to that organ, but it is broken up in the intestine into salicylic acid and methylene-citric acid. From its chemical constitution it is reasonable to expect it to have the same systemic actions and uses as salicylic acid.

It is said to be useful in influenza, coryza, tonsillitis, rheumatic conditions, gout and neuralgic conditions.

Dosage.—1 Gm. (15 grains) several times daily.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 858,142 (June 25, 1907; expires 1924). U. S. trademark No. 62,613.

Novaspirin Tablets, 5 grains. Each tablet contains novaspirin 0.33 Gm. (5 grains).

NOVOCAINE.—Novocaine is 1-para-aminobenzoyl-2-diethylaminoethane hydrochloride. $CH_2(C_6H_4.NH_2.COO).CH_2[N(C_2H_5)_2].HCl$, the monhydrochloride of para-aminobenzoyldiethylaminoethanol.

Novocaine crystallizes from alcohol in fine, colorless needles, which melt at 156° C. (312.8° F.). It is soluble in an equal weight of water, but requires 30 parts of alcohol. From the aqueous solution, which is neutral, alkali hydroxides and carbonates precipitate the free base in the form of a colorless oil, which soon congeals to a crystalline mass, but solution of sodium bicarbonate is miscible with solutions of novocaine without producing either precipitation or turbidity. The free base crystallizes from diluted alcohol with 2 molecules of water, but from ether or ligroin in the form of anhydrous shining prisms, which melt at 58° to 60° C. (136.4° to 140° F.), while the hydrated base melts at 51° C. (123.8° F.).

The aqueous solution of the salt may be heated to boiling without decomposition, and remains perfectly clear when kept for days in loosely stoppered vials. It gives precipitates even in very dilute solutions with the usual alkaloidal reagents, such as potassium mercuric-iodide, picric acid, potassium iodide, etc.

It is incompatible with alkalies and their carbonates and the alkaloidal reagents.

Actions and Uses.—It is a local anesthetic similar to cocaine, but said to be far less toxic than any of the cocaine substitutes. When injected subcutaneously it is said to exert a prompt and powerful anesthetic action, but the effect is not sustained. This may be remedied by the simultaneous injection of suprarenal alkaloid. Novocaine is not irritant. (See note under Creosote Carbonate.)

It is said to be useful in all cases in which cocaine is indicated.

Dosage.—For infiltration anesthesia, solutions of 0.25 Gm. (4 grains) novocaine in 100 or 50 Gm. (3.2 or 1.6 ounces) physiologic salt solution, with 5 or 10 drops of epinephrine solution (1-1000); for instillations and injections, solutions of 0.1 Gm. (1½ grains) novocaine in 10 or 5 Gm. (150 or 75 grains) salt solution, with or without 10 drops of epinephrine solution (1-1000). In ophthalmology, 1 to 5 to 10 per cent. solution, in rhino-laryngology 5 to 20 per cent. solutions are recommended, with the addition of 6 to 8 drops of epinephrine solution (1-1000) to each 10 Cc. (160 minims). Internally, owing to its feeble toxicity, it may be given in doses up to 0.5 Gm. (7½ grains) to adults.

Manufactured by Farbwerke, vorm. Meister, Lucius & Breuning, Hoechst a. M., Germany (Victor Koechl & Co., New York).

Hypodermic Tablets Novocaine, 1/3 grain. Each tablet contains novocaine 0.020 Gm. (⅓ grain).

NOVOCAINE NITRATE—Novocainæ Nitras.—Novocaine nitrate is, 1-para-aminobenzoyl-2-diethylamino-ethane nitrate, $C_6H_4.NH_2(COO.C_2H_4.N(C_2H_5)_2.HNO{=}C_{13}H_{21}O_2N_2$, the nitrate of p-aminobenzoyldiethylaminoethanol, the base contained in novocaine.

Novocaine nitrate occurs in small colorless and odorless crystals, soluble in water and alcohol. The aqueous solution is neutral in reaction. Melting point 100°-102° C. (212°-215° F.).

If 0.1 Gm. novocaine nitrate be dissolved in 1 Cc. concentrated sulphuric acid and a solution of ferrous sulphate carefully floated above it, a brown zone is formed at the surface of contact of the

two solutions. 1 part novocaine nitrate dissolved in 10 parts water and acidified with nitric acid, should yield no precipitate upon the addition of silver nitrate solution.

Actions and Uses.—As for novocaine; may be prescribed in combination with silver salts, with which it forms no precipitate.

Dosage.—Used in 3 per cent. solutions.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York).

U. S. patent No. 812,554 (Feb. 13, 1906; expires 1923). Trademark No. 53,072.

NUCLEIN, NUCLEIC ACID AND NUCLEATES

Nucleins are modified nucleoproteins obtained by peptic digestion or by treatment with dilute acids. They are split up by the action of alkalies or by tryptic digestion into a protein constituent and a nucleic acid. The exact composition of the protein and of the nucleic acid varies somewhat with the source of the nucleoprotein from which it is derived. The nucleic acids of commerce are apt to contain some protein in combination. They are most commonly made from yeast cells, but have been made, also, from the wheat embryo, the sperm of certain fishes and from the thymus and pancreas glands. In composition they approximate the formula: $C_{35}H_{52}N_{14}O_{28}P_4$. From the wheat embryo products with relatively more nitrogen have been obtained.

Nucleins are colorless, amorphous, insoluble in alcohol and ether and insoluble or slightly soluble in water. They are more or less readily dissolved by dilute alkalies. They give the biuret test and Millon's reaction. They show a great affinity for many dyes, taking them up from aqueous or alcoholic solutions. The term nuclein is sometimes used to designate an impure nucleic acid, which usage has led to confusion as the nucleic acids are bodies of definite composition.

Both nucleins and nucleic acids yield metaphosphoric acid on incineration. On fusion with potassium nitrate and sodium carbonate they yield alkali phosphates.

Actions and Uses.—Nuclein and nucleic acid and nucleates are said to increase the number of white corpuscles, and it has been claimed that this increases the resistance to infections. These results have been obtained by intravenous or hypodermic injection, and on this basis therapeutic deductions have been made; it is doubtful whether we are warranted in applying these conclusions to the administration of the remedy by the mouth.

Nuclein and nucleic acid and nucleates have been used in tuberculosis and various infections, but their true value is undetermined.

They are transformed in the organism into purin compounds and may cause the amount of uric acid in the urine to be increased.

NUCLEIN—Nucleinum.—Nuclein is a modified nucleoprotein obtained by peptic digestion or by treatment with dilute acids.

Actions and Uses.—See Nuclein, Nucleic Acid and Nucleates.

Dosage.—0.5 to 1 Gm. (8 to 15 grains) three times a day.

NUCLEIC ACID.—Acidium Nucleicum.—Nucleinic Acid.—Nucleic acid is an organic acid obtained from nuclein by the action of alkalies or by tryptic digestion.

Nucleic acid is an amorphous, white powder and has an acid reaction. It is readily soluble in ammoniacal or alkaline water with the formation of water-soluble salts. From these solutions it is precipitated by slight excess of hydrochloric acid but not by acetic acid. It is insoluble in alcohol and ether. When chemically pure it does not give the biuret test or Millon's reaction, but a slight response to these reagents does not indicate a degree of impurity incompatible with its use as a medicinal agent.

It should contain between 14.5 and 16.5 per cent. of nitrogen and between 8.5 and 10.5 per cent. of phosphorus, the relative proportion being 4 atoms of P to 14 or 16 N, approximately.

Actions and Uses.—See Nuclein, Nucleic Acid and Nucleates.

Dosage.—0.06 to 0.3 Gm. (1 to 5 grains) three times a day.

Non-Proprietary Preparation:

Nucleinic Acid Merck (from Yeast).—Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

SODIUM NUCLEATE.—Sodii Nucleas.—Sodium Nucleinate. Sodium Nucleate is the sodium salt of nucleic acid.

Actions and Uses.—See Nuclein, Nucleic Acid and Nucleates.

Dosage.—Practically the same as that of Nucleic Acid.

Proprietary Preparations:

NUCLEIN, Abbott.—Sodium Tritico-Nucleinate, Abbott. A sodium nucleate derived from the wheat germ.

It is a grayish-white powder, soluble in water and insoluble in alcohol. On incineration it yields approximately 26 per cent. of ash, which is slightly alkaline and readily soluble in water. It contains phosphorus and nitrogen in the ratio of 1 atom of P. to 3.66 N. When the aqueous solution is decomposed by weak hydrochloric acid, a voluminous precipitate of the free nucleic acid is formed.

Actions and Uses.—See Nuclein, Nucleic Acid and Nucleates.

Dosage.—See Nucleic Acid.

Manufactured by the Abbott Alkaloidal Co., Chicago. Not patented or trademarked.

Nuclein Solution, Abbott.—Liquor Sodii Tritico-Nucleinatis Abbott.—A solution of Nuclein-Abbott containing approximately 10 Gm. of the salt in 100 Cc. (6 grains in one fluidram) of a menstruum containing 15 per cent. of alcohol. The solution is standardized to contain 1 mg. phosphorus in 1 Cc.

The aqueous extract of the wheat germ is treated with sodium chloride and acid, the precipitate digested with pepsin, neutralized with sodium hydroxide and purified by precipitation with alcohol. The resulting sodium tritico-nucleinate is dissolved in distilled water and 15 per cent. of alcohol as a preservative.

Nuclein Tablets, Abbott.—Each tablet is said to contain 0.13 Cc. (2 minims) of Nuclein Solution. Abbott.

OIL OF PINE NEEDLES—Oleum Pini.—Oil of Pine (British Pharm., edit. 8), Oleum Pini Pumilionis (Pharm. Austriaca, edit. 8). Oil of pine needles is the oil distilled from the fresh leaves of Pinus Pumilio, Haenke (British Pharm., edit. 8).

Oil of pine occurs as a colorless or faintly yellowish liquid, having a pleasant, aromatic odor, and a pungent taste. The oil is soluble in 4.8 volumes 90 per cent. alcohol (Hager, 1908). Specific Gravity, 0.865 to 0.875; begins to boil at 165° C. (329° F.). (British Codex, 1907.)

It should rotate the plane of a ray of polarized light from 5° to 10° to the left at 15.5° C. (60° F.) in a tube 100 millimeters long. Not more than 10 per cent. should distil below 165° C. (329° F.).

***Action and Uses.*—Oil of pine is employed principally as an inhalant with hot water for its stimulating and disinfecting action in catarrh of the respiratory passages, chronic laryngitis and bronchitis. It has been applied locally and given internally in the treatment of chronic rheumatic affections. When added to ether it is said to allay the irritation and diminish the bronchial secretion, which frequently become excessive, during or after the production of anesthesia by the latter drug.**

***Dosage.*—0.05 to 0.3 Cc. (1 to 5 minims). The oil is given internally as a respiratory antiseptic and "expectorant," being taken on sugar, in capsules, or in the form of pastilles. It is rubbed over rheumatic joints, which are then covered with cotton wool, or 4 Cc. (1 fluidram) of the oil may be added to a warm bath.**

Vapor Olei Pini.—Oil of Pine, 10 Cc.; Magnesium Carbonate, 5 Gm.; Distilled water, sufficient to produce 100 Cc.

Mix the oil with the magnesium carbonate and add the water. A quantity sufficient for one inhalation, 4 Cc. (1 fluidram), is to be placed with 300 Cc. (10 fluidounces) of cold water and 300 Cc. (10 fluidounces) of boiling water in an apparatus so arranged that the air to be inhaled may pass through the solution.

Pine oil inhalation is used as a mild antiseptic in catarrhal affections of the respiratory passages.

OLEORESIN OF PARSLEY SEED—Oleoresina Apii.—Apiol, Green.—An oleoresin obtained from parsley seed by extraction with alcohol.

Parsley seed is extracted with alcohol, the alcohol recovered, and the liquid portion of the residue freed from the solid, waxy matter which separates on standing.

Oleoresin of parsley seed is a greenish, oily liquid, insoluble in water, but soluble in alcohol, ether, and chloroform. Sp. gr. about 1.05.

Actions and Uses.—See Apiol.

Dosage.—0.3 to 1 Cc. (5 to 15 minims) in capsules.

ORGANIC IRON PREPARATIONS

The term, "organic iron" ("masked" or "non-ionic" iron) is confined by modern usage to those organic compounds of iron which do not give the chemical tests of this metal (blue color with potassium ferrocyanide, blue-black color with hematox-

ylin, etc.) until the structure of the molecule has been destroyed by reagents. The resistance to this destruction varies greatly; some (such as hemoglobin) require incineration or the action of concentrated acids; while others give the iron-tests after treatment with even fairly dilute acids. The organic iron compounds occurring naturally in animal and vegetable tissues (which are often termed "food-irons") belong generally to the more resistant class, while the iron of the synthetic preparations is usually liberated fairly readily. This does not, however, constitute a sharp line of distinction between the two classes, nor is there any good evidence that they differ in therapeutic action. Until this difference is established all organic iron preparations, whatever their source, may be placed in a single class. It is evident, however, that an organic iron (chemically) which is destroyed by 0.2 per cent. hydrochloric acid at the body temperature, cannot be classed as an organic iron in the therapeutic sense. It should also be emphasized that salts of iron (which give the iron tests directly) are classed as inorganic iron, whatever the acid radicle. True albuminates, peptonates, etc., of iron are, therefore, inorganic.

Actions and Uses.—Organic iron preparations are used to increase the hemoglobin in conditions of anemia. Bunge supposed that only organic iron could be absorbed and assimilated by the body, the reputed action of inorganic iron being altogether indirect, and due to its local effects on the alimentary canal. This theory was modified by Abderhalden, to the effect that inorganic iron, while it could not be converted into hemoglobin, nevertheless stimulated the assimilation and conversion of organic iron. The later work, however (Tartakowski) seems to prove conclusively that inorganic iron is assimilated and converted into hemoglobin, and is in so far therapeutically, fully equal to organic iron. Many authors, nevertheless, still adhere to the theories of Bunge and Abdernalden At all events, a real difference exists between the organic and most of the inorganic preparations, namely, in the local irritant and astringent action of the latter, and the absence of these effects in most of the organic compounds. These actions may be desirable in some cases, and undesirable in others. It should also be remembered that organic iron ay often be administered in sufficient amount, and most economically, by selecting a dietary rich in iron, such as red meats, egg-yolks, green vegetables, whole wheat, etc.

ORGANS OF ANIMALS

The discovery of the importance of internal secretions has led to extensive clinical trials with preparations of the so-called ductless glands, and other tissues which elaborate, or are supposed to elaborate such internal secretions. Two of these, the thyroid and suprarenal glands, have given decisive therapeutic results and have become official in the Pharmacopeia; preparations of the active principle of the suprarenal are described in this book under the heading of "Epinephrin." The other organ products are scarcely beyond the experimental stage, and may therefore be described together. Their active principles have not been isolated, and they are most commonly used in the form of the powdered dried gland. The gross fat and connective tissue should be removed as completely as possible, and the drying should be conducted at a relatively low temperature. The powder is frequently compressed into tablets. It is recommended that the strength of these should be stated in terms of the dried gland. Since there are no tests for the quality, or even identity, of these powdered products, the physician, unless he can himself supervise their preparation, is forced to rely on the general reputation of the manufacturer.

After the description of each gland a list of such preparations as have been submitted to the Council, and which are being marketed in an unobjectionable manner, is given. For the reasons stated, however, the Council disclaims any responsibility for their quality or identity.

CORPUS LUTEUM

It is generally recognized that one or more of the most important of the internal secretions of the ovaries originate in the corpora lutea and the latter have been tried recently to a considerable extent in some of the classes of cases in which the entire gland has been used. Thus, it is stated that in cases of artificial menopause, following operation, the use of the dried corpus luteum has been followed by great improvement. It may be given in the form of tablets, each of which is composed of a dried corpus luteum, obtained from a pregnant animal, usually a pig; or it may be given as "lutein" in twenty grain doses, three times a day, in some cases given continuously, in others periodically when the discomforts are greatest, and continued for about ten days at a time. The "lutein" is made by squeezing out the corpora lutea from the ovaries of the pig obtained at the slaughter house. The corpora are then rapidly dried, powdered, and compressed into tablets. These preparations are stated to frequently give good results when the ordinary ovarian extract made from the dried tissues of the ovary itself fails.

Corpus luteum has also been recommended in obesity associated with amenorrhea and in other conditions of "ovarian insufficiency" and in dysmenorrhea. This substance also, however, is still of questionable value in these various conditions, the evidence being not yet sufficient for judgment.

Drevet recommends that an extract of the corpora lutea, prepared as follows, be used: 1 kilo of finely divided corpora lutea are macerated in the cold for forty-eight hours with a mixture of 500 Cc. glycerine, 500 Cc. distilled water and 10 Cc. sulphuric acid. The liquid is filtered, neutralized with soda and the precipitate after being washed, is dissolved in acetic acid and again precipitated. The precipitate is then dried in vacuo. Dose of this extract, 0.04 Gm. to 0.08 Gm. (⅔ to 1⅓ grain) gradually increased to 0.12 Gm. (2 grains).

DESICCATED CORPUS LUTEUM—Armour.—Desiccated corpus luteum—Armour, consists of the fresh substance from the corpora lutea from cow's ovaries, removed, dried and powdered without the addition of preservative or diluent.

A yellowish powder, having a peculiar odor. Partly soluble in water.

One part represents approximately 5 parts of the fresh corpus luteum substance. It contains a true lipochrome which may be extracted by alcohol, ether or chloroform. On incineration, it should yield not more than 6 per cent. of ash.

Actions and Uses.—See Corpus Luteum.

Dosage.—0.03 to 0.06 Gm. (½ to 1 grain) twice daily.

Manufactured by Armour & Co., Chicago. Not patented or trademarked.

MAMMARY GLAND

The extracts of the mammary gland are said to have an effect upon the uterus. They have been used in the treatment of profuse and painful menstruation and of uterine and ovarian tumors, but the beneficial results reported can hardly be accepted until confirmed by further observations.

MAMMARY SUBSTANCE—Armour.—Mammary Substance—Armour, consists of the mammary gland of the sheep freed from fat, cleaned, dried and powdered, without the addition of preservative or diluent.

A yellowish to orange colored powder, having a slight peculiar odor. Only partially soluble in water.

One part represents approximately 4½ parts of the fresh mammary gland of the sheep. It contains nucleoproteid which, when treated with dilute sulphuric acid, yields guanin. (S. Fränkel, Descriptive Biochemie, p. 386). Upon incineration, it should not yield more than 9 per cent. ash.

Actions and Uses.—See Mammary Gland.

Dosage.—0.13 to 0.3 Gm. (2 to 5 grains) three times daily.

Manufactured by Armour & Co., Chicago. Not patented or trademarked.

Mammary Substance Tablets-Armour.—Each tablet contains desiccated mammary substance 0.13 Gm. (2 grains).

Dose.—1 to 3 tablets three times a day.

OVARY

The ovaries produce internal secretions which are necessary for the proper functioning of the uterus and which also have obscure effects on metabolism and the nervous system. Diminution or cessation of the activity of the ovaries (as at menopause, natural or artificial) often leads to a variety of nervous symptoms; irregularities in their activities seems to be sometimes accompanied by dysmenorrhea. Ovarian substance has been administered, often with apparently good

results, for the relief of symptoms following the natural or artificial menopause and in dysmenorrhea, intermenstrual pain, etc.

OVARIAN SUBSTANCE—Armour. — Ovarian Substance—Armour, consists of the entire fresh ovaries (including the corpora lutea) of the hog, cleaned, dried and powdered, without the addition of either preservative or diluent.

A yellowish colored powder having a peculiar odor. Partially soluble in water.

One part represents approximately 6¾ parts of the fresh ovary of the hog. It contains gelatin, mucin, nuclein and the active constituent of the corpus luteum. Upon incineration, it should not yield more than 7 per cent. ash.

Actions and Uses.—See Ovary.

Dosage.—0.06 to 0.2 Gm. (1 to 3 grains) three times daily.

Manufactured by Armour & Co., Chicago. Not patented or copyrighted.

Ovarian Substance Tablets-Armour.—Each tablet contains ovarian substance 0.13 Gm. (2 grains).

Dose.—1 to 2 tablets three times a day.

PARATHYROID GLAND

The parathyroid gland, even in small doses, has a pronounced action on the course of the tetany resulting from the removal of or injury to the parathyroid glands. Its use checks the convulsions and removes the feeling of fear, the nausea and diarrhea and has undoubtedly at times greatly prolonged life or saved it while the injured parathyroid glands regained their functions. The fresh gland seems to be more active than the dried commercial preparation.

The drug has been used most successfully in tetany following removal of the parathyroids; its use in idiopathic and other non-operative forms of tetany has been much less satisfactory.

DESICCATED PARATHYROID GLAND—Armour.—Desiccated Parathyroid Gland—Armour, consists of the exterior parathyroids of the ox freed from fat, cleaned, dried and powdered, without the addition of preservative or diluent.

A light yellow powder, having a peculiar odor. Partly soluble in water.

One part represents approximately six parts of the fresh tissue. On incineration it should yield not more than 7 per cent. ash. It contains very small amounts of organically combined iodine.

Action and Uses.—See Parathyroid Gland.

Dosage.—0.006 Gm. (1/10 grain) four times a day.

Manufactured by Armour & Co., Chicago.

Parathyroid Tablets, Armour.—Each tablet contains desiccated parathyroid gland 0.003 Gm. (1/20 grain).

PAROTID GLAND

The suggested uses are similar to those for the mammary and ovary; it has been recommended in artificial menopause, intermenstrual pain and other conditions in which the ovary or corpus luteum are used.

DESICCATED PAROTID GLAND—Armour. — Desiccated Parotid Gland—Armour, consists of the fresh parotid gland of the ox, freed from fat, cleaned, dried and powdered, without the addition of either preservative or diluent.

A yellowish colored powder, having a slight peculiar odor. Partially soluble in water.

One part represents approximately 5 parts of the fresh parotid gland of the ox. Upon incineration, it should yield not more than 7 per cent. ash.

Actions and Uses.—See Parotid Gland.

Dosage.—0.2 to 0.3 Gm. (3 to 5 grains) three times daily.

Manufactured by Armour & Co., Chicago. Not patented or trademarked.

Parotid Tablets-Armour.—Each tablet contains desiccated parotid gland 0.13 Gm. (2 grains).

Dose.—1 to 2 tablets three times a day.

PITUITARY GLAND

The removal of this body in animals is followed by symptoms of motor disturbances, depression, emaciation, and rapid death. The infundibular portion of the gland causes, when injected intravenously, a rise of blood pressure and slows but strengthens the action of the heart. It contains a substance soluble in water, and not destroyed by boiling, which is stated to cause dilation of the renal vessels and a marked increase in the secretion of urine. The gland has been found to be abnormal in many cases of acromegaly and so is believed by many to have an internal secretion acting on the growth of bones. The anterior lobe is claimed to have properties similar to those of thyroid extract.

The drug has a doubtful effect on the circulation when given by the mouth, but the infundibular portion may be useful in cardiac debility. An extract of this part of the gland has been recommended as a diuretic. The results of the use of the gland in acromegaly are uncertain, but the output of phosphates is said to be increased. It may be given at the first symptom of debility or functional disturbances.

DESICCATED PITUITARY SUBSTANCE (ANTERIOR LOBE)—Armour.—Desiccated pituitary substance (anterior lobe)—Armour consists of the anterior lobe from the pituitary of the ox, separated, dried and powdered without the addition of preservative or diluent.

A light grayish yellow powder, having a slight peculiar odor. Partly soluble in water.

One part represents approximately 4.5 parts of the fresh substance. On incineration, it should yield not more than 6.5 per cent. ash.

Action and Uses.—See pituitary gland above.

Dosage.—0.05 to 0.20 Gm. (1 to 4 grains) in powder or tablet.

Manufactured by Armour & Co., Chicago.

DESICCATED PITUITARY SUBSTANCE (POSTERIOR LOBE)—Armour.—Desiccated pituitary substance (posterior lobe)—Armour consists of the posterior lobe from the pituitary of the ox, separated, dried and powdered without the addition of preservative or diluent.

A light grayish yellow powder having a slight peculiar odor. Partly soluble in water.

One part represents approximately 4.5 parts of the fresh substance. On incineration, it should yield not more than 6.2 per cent. of ash.

Action and Uses.—See pituitary gland.

Dosage.—0.05 to 0.20 Gm. (1 to 4 grains) in powder or tablet.

Manufactured by Armour & Co., Chicago.

PITUITARY BODY, DESICCATED—Armour.—Desiccated pituitary body—Armour, consists of the dried substance of the entire pituitary body of the ox, including the infundibulum and the anterior and posterior lobes without the addition of preservative or diluent. It is said to contain all the active principles naturally existing in the gland.

A light yellowish-gray powder, practically odorless and tasteless. One part represents approximately 4 parts of fresh gland.

Actions and Uses.—See pituitary gland.

Dosage.—0.06 to 0.2 Gm. (1 to 3 grains) three times a day.

Manufactured by Armour & Co., Chicago. Not patented or trademarked.

Pituitary Tablets.—Armour.—Each tablet contains desiccated pituitary body 0.06 Gm. (1 grain).

RED BONE MARROW

Red bone marrow consists largely (more than 90 per cent.) of fat. In new born animals a third or more of this fat consists of lecithin. The marrow of the bones of new-born animals contains iron (up to 1 per cent. or more) in various forms of organic combination. Both lecithin and iron decrease rapidly in the first weeks after birth. The commercial preparations contain very variable amounts of these constituents.

Action and Uses.—Red bone marrow is supposed to stimulate the formation of red blood corpuscles; whatever action it may have in this direction is probably due largely to the iron and lecithin which it contains.

It is recommended in simple and pernicious anemias.

EXTRACT OF RED BONE MARROW.—Extract of red bone marrow is a glycerin extract of the red marrow of bones. It contains about 2 per cent. of proteids, about 0.1 per cent. of lecithin and about 85 per cent. of glycerin.

It is a brownish liquid of an agreeable aromatic taste.

Actions and Uses.—This preparation is claimed to stimulate the formation of the red blood corpuscles.

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It is recommended in simple and pernicious anemia, but its value is not yet beyond question.

Dosage.—4 to 8 Cc. (1 to 2 fluidrams) in water, milk or wine, three times a day.

Prepared by Armour & Co., Chicago.

SPLEEN

Spleen has been used empirically in anemia, chlorosis, myxedema and various other diseases with no definite results.

DESICCATED SPLEEN—Armour. — Desiccated Spleen—Armour, consists of the spleen of the calf, freed from fat, cleaned, dried and powdered, without the addition of preservative or diluent.

A dark yellowish colored powder, having a peculiar odor. Partially soluble in water.

One part represents approximately 4¾ parts of the fresh spleen substance. It contains nuclein and iron. Upon incineration, it should yield not more than 7 per cent. ash.

Actions and Uses.—See Spleen.

Dosage.—0.13 to 0.25 Gm. (2 to 4 grains) every three or four hours.

Manufactured by Armour & Co., Chicago. Not patented or trademarked.

Spleen Tablets-Armour.—Each tablet contains desiccated spleen 0.065 Gm. (1 grain).

Dose.—1 to 3 tablets three times a day.

TESTICLE

Subcutaneous injections of testicular extracts were claimed to increase muscular energy from 10 to 20 per cent. Oxidation has been said to be somewhat increased and extracts of the gland have been used in obesity, but the results have been most uncertain. It has also been employed in prostatic hypertrophy and many other conditions.

ORCHIC SUBSTANCE—Armour. — Orchic Substance—Armour, consists of the pulp from fresh ram testicles removed, dried and powdered, without the addition of preservative or diluent.

A light yellow powder, having a peculiar odor. Partly soluble in water.

One part represents approximately 7 parts of the fresh pulp from the ram testicle. Upon incineration, it should yield not more than 10 per cent. ash.

Actions and Uses.—See Testicle.

Dosage.—0.13 to 0.3 Gm. (2 to 5 grains) three times a day.

Manufactured by Armour & Co., Chicago. Not patented or copyrighted.

Orchic Substance Tablets-Armour.—Each tablet contains orchic substance 0.13 Gm. (2 grains).

Dose.—1 to 3 tablets three times a day.

THYMUS GLAND

Little is known as to the functions of the thymus, but it is believed to have an important relation to growth. There also seems to be some relation between the thymus and thyroid, for the former is frequently abnormal in diseases involving the latter (exophthalmic goiter).

The use of thymus is purely empirical. It has been employed in the treatment of exophthalmic goiter, rickets, tuberculosis, hemophilia, and infantile marasmus and atrophy; its use in the latter conditions is said to be the most promising. It is claimed on very doubtful grounds to exert a somewhat favorable effect in certain cases of cancer.

DESICCATED THYMUS—Armour.—Desiccated Thymus—Armour, consists of the fresh thymus gland of the calf freed from fat, cleaned, dried and powdered, without the addition of preservative or diluent.

A very light yellow powder, having a peculiar odor. Partly soluble in water.

One part represents approximately 5 parts of the fresh thymus gland. It is rich in nucleoprotein and in lymphoid tissue. Upon incineration, it should yield not more than 12 per cent. ash.

Actions and Uses.—See Thymus Gland.

Dosage.—0.13 to 0.25 Gm. (2 to 4 grains) three times daily.

Manufactured by Armour & Co., Chicago. Not patented or trademarked.

Thymus Tablets-Armour.—Each tablet contains desiccated thymus 0.065 Gm. (1 grain).

Dose.—2 to 4 tablets three times a day.

ORPHOL—Bismuthi Beta-Naphtholas.—Orphol is bismuth beta-naphtholate, a bismuth salt of beta-naphthol.

Bismuth beta-naphtholate occurs in the form of a brownish or grayish powder without odor, almost tasteless and insoluble in water. It is slightly soluble in alcohol.

1 to 2 Gm. bismuth beta-naphtholate is shaken in a separator during one hour with 25 Cc. chloroform and 25 Cc. concentrated hydrochloric acid, and then 50 Cc. water added and again shaken. The chloroform solution drawn off and the acid mixture extracted with three more portions of 10 Cc. chloroform and the combined extracts evaporated and dried to constant weight over sulphuric acid, a residue should remain weighing at least 15 per cent. of the material used, and should respond to tests of identity for beta-naphthol.

The acid solution from which the naphthol has been extracted is transferred to a beaker, diluted to 200 Cc., heated to boiling, ammonia water added till turbidity appears, then sufficient hydrochloric acid to clear up the turbidity and then 50 Cc. of 10 per cent. ammonium phosphate solution is added to the boiling liquid. The precipitate is allowed to subside, the clear liquid decanted through a tared porcelain Gooch crucible, the precipitate washed with hot water by decantation and finally transferred completely to the crucible. The precipitate and crucible are dried, placed in a nickel crucible, and exposed to the full heat of a bunsen flame till the weight is constant. The weight of the resulting bismuth phosphate multiplied by 0.6869 should yield a figure (representing bismuth, Bi) equal to not less than 60 per cent. of the material taken.

1 to 2 Gm. bismuth beta-naphtholate is weighed to a small asbestos plugged percolating tube, 5 Cc. chloroform added, mixed by means of a glass rod, and allowed to percolate into a tared dish. When the liquid ceases to drop, a further portion of 5 Cc. of chloroform is poured into the percolator and also allowed to percolate into the tared dish. The stem of the percolator is washed with a little chloroform, and the combined washings and the percolates allowed to evaporate spontaneously and the residue brought to constant weight over sulphuric acid. The residue should not exceed 1 per cent. of the material taken.

Actions and Uses.—Bismuth beta-naphtholate is decomposed into its constituents in the intestines, where it exerts the effects of bismuth salts and of beta-naphthol. Hence it is used in catarrhal and fermentative gastroenteric disorders, such as gastritis, dysentery, diarrhea, etc. (See note under Betanaphthol Benzoate.)

Dosage.—For children 0.1 to 0.3 Gm. (1½ to 5 grains) and for adults 1.5 to 5 Gm. (22 to 75 grains) daily.

A mixture of beta-naphthol with acacia should be avoided as a viscid precipitate rapidly becoming hard is likely to be formed.

Manufactured by the Chemische Fabrik von Heyden, Radebeul near Dresden, Germany (Schering & Glatz, New York). U. S. patent No. 516,358 (March 13, 1894; expires 1911)). U. S. trademark No. 27,482.

Orphol Tablets.—Each tablet contains orphol, 0.3 Gm. (5 grains).

ORTHOFORM-NEW — Meta-Amido-Para-Oxybenzoate of Methyl.—Orthoform-new is methyl meta-amino-para-oxybenzoate, $C_6H_3.NH_2.OH.COO(CH_3)$, 3:4:1 = $C_8H_9O_2N$, the meta-amino-para-oxybenzoic acid ester of methyl alcohol.

It is prepared by the nitration of para-oxybenzoate of methyl and reduction of the nitro-product obtained.

It occurs in a fine, white, crystalline powder, neutral in reaction, and melting at 141° to 143° C. (285.8° to 289.4° F.), odorless and tasteless. It is scarcely soluble in water, but soluble in 5 or 6 parts of alcohol and 50 parts of ether. It is decomposed by boiling with water or by warming with alkalies or their carbonates, into methyl alcohol and paroxybenzoic acid. When crystallized from chloroform it sometimes assumes the form of white crystals melting at 110° to 111° C. (230° to 231.8° F.) returning on melting to the ordinary form.

The filtrate obtained after shaking a small portion with water produces a fugitive color with ferric chloride and should not give a reaction with silver nitrate. A solution of 0.1 Gm. in 2 Cc. of water by the aid of hydrochloric acid is colored yellowish red on addition of sodium nitrate and then deposits a yellow precipitate, deepening to red on exposure to the air.

It is decomposed by heating with water; it is incompatible with alkalies and their carbonates.

Actions and Uses.—Orthoform-new is a local anesthetic, resembling cocaine in its local action, but not penetrating the tissues on account of its insolubility. It has practically no action on the unbroken skin and produces no irritation except slight corrosion about the place of application. It is somewhat antiseptic and practically non-toxic in the usual doses.

It is used internally to relieve the pain of gastric ulcer. Since it acts only on ulcerated surfaces, the relief of pain has been assumed to be evidence of the existence of an open ulcer. It has been applied locally as an analgesic to wounds of every description. It has been used in dentistry, in nasal catarrh, hay fever, etc.

Dosage.—Internally, 0.5 to 1 Gm. (8 to 15 grains) in emulsion; locally, in substance as a dusting powder or mixed with milk sugar for insufflation, dissolved in ether and mixed with oil for pencilings, or as salve with wool fat, etc.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patents Nos. 610,348 (Sept. 6, 1898; expires 1915) and 625,158 (May 16, 1899; expires 1916).

ORTHOFORM-NEW HYDROCHLORIDE. — Orthoform-new hydrochloride, $C_8H_9O_3N.HCl$, is the hydrochloride of methyl meta-amino-para-oxybenzoate.

It is a white, crystalline powder, having an indefinite melting point and an acid reaction. It is soluble in 10 parts of water. Its reactions are the same as those of orthoform-new, except that it gives a reaction for chlorides with silver nitrate and has an acid reaction; 3.65 Gm. dissolved in 50 Cc. of alcohol require not less than 17.8 Cc. nor more than 18 Cc. of normal solution of sodium hydroxide to produce a neutral liquid.

Its incompatibilities are the same as those of orthoform-new.

Actions and Uses.—The actions, uses and dosage of this compound are similar to those of orthoform-new, which see.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York).

OSMIUM TETROXIDE—Osmium Tetroxidum.—Osmic acid, Osmium anhydride-Osmium tetroxide, OsO_4, the anhydride of a theoretical acid is obtained by the action of nitrohydrochloric acid on osmium.

Osmium tetroxide occurs in the form of white or yellowish crystals which are slowly soluble in water (1-50); it is also soluble in alcohol and ether but the solutions decompose. Osmium tetroxide melts at 40° C. (104° F.) and boils at about 100° C. (212° F.). It vaporizes even at ordinary temperatures yielding very irritating and extremely poisonous vapors, attacking the eyes and lungs. It is decomposed by contact with organic substances. (Brit. Codex, 1907).

From aqueous acidified solutions of osmium tetroxide, hydrogen sulphide precipitates brown osmium sulphide, OsS_4, which is insoluble in ammonium sulphide. An aqueous solution of osmium tetroxide decolorizes indigo solution. Iodine is liberated from potassium iodide solutions by osmium tetroxide. Treated with sulphuric acid, aqueous solutions of osmium tetroxide become yellow, turning to brown and finally becoming blue; tannic acid produces a red color becoming brown; ferric chlorid and alcohol reduce osmium tetroxide to the metal osmium.

Action and Uses.—Intraneural injections are used to produce degeneration of nerves for the relief of persistent neuralgias. The treatment is best applied by injecting ½ to 1 Cc. of a fresh 1 to 2 per cent. solution directly into the, preferably exposed, nerve. The result is sometimes immediate, but more commonly it is not complete until after one or two weeks, or it may even fail entirely. If successful, the effects may persist for several months, when it may become necessary to repeat the injection as the cure is rarely, if ever, permanent. The local reaction is always painful, but not serious. It is not advisable, perhaps, to use osmium tetroxide in renal disease.

OVOFERRIN—Ferri Vitellinum Syntheticum.—Ovoferrin is a solution containing 5 per cent. of an artificial proteid-product in which iron is present in the so-called "organic" or "masked" form (a form which does not give the iron-test directly) equivalent to 0.4 Gm. metallic iron to each 100 Cc. The solution also contains 9 per cent. of alcohol.

Ovoferrin is prepared by modifying serum-albumin by electrolysis, producing a proteid which is classed by the manufacturers as a vitellin, and introducing ferric hydrate into this proteid by heating under pressure. The "vitellin" constituent of this preparation should not be confounded with the well-known vitellin of yolk of eggs.

The solution has a reddish-brown color, little odor, and a flat, slightly aromatic and alcoholic taste.

The solution does not give a blue color on the addition of potassium ferrocyanide solution; a blue tint develops slowly if an equal volume of 5 per cent. hydrochloric acid is added to the mixture; a deep blue color develops at once if this mixture is boiled (difference from the egg yolk).

The solution is not precipitated by boiling, but gives precipitates with the alkalies, with which it is incompatible. It is also precipitated on half saturation with ammonium sulphate. It is not precipitated by acids.

Actions and Uses.—Ovoferrin is stated to be not appreciably affected by the gastric juice, a 0.5 per cent. solution of hydrochloric acid liberating its iron very slowly and incompletely. The product ranks with the other forms of artificially masked iron, which are devoid of the local action of the soluble inorganic iron salts, and, according to some authorities, are more readily absorbed and utilized.

Dosage.—8 to 16 Cc. (2 to 4 fluidrams) corresponding to 0.03 to 0.06 Gm. (½ to 1 grain) of elemental iron three times a day.

Manufactured by A. C. Barnes Co., Philadelphia. U. S. trademark.

OXAPHOR.—Oxaphor is a 50 per cent. solution of oxycamphor, $C_8H_{14}\begin{matrix}CHOH\\ \diagup\\ \diagdown\\ CO\end{matrix}$ $= C_{10}H_{16}O_2$, a derivative of camphor in which a hydrogen atom has been replaced by a hydroxyl group.

Oxycamphor is prepared by reducing camphor quinone $C_8H_{14}(CO)_2$ by means of zinc dust and acids, extracting the oxycamphor from the liquid product of the reaction with an immiscible solvent and purifying it by distillation with steam.

Oxycamphor is a white crystalline powder, neutral in reaction, melting at 203° to 205° C. (397.4° to 401° F.). It is soluble in about 50 parts of cold water, more soluble in warm water, and readily soluble in all organic solvents except petroleum benzin, in which it is soluble, but from which it crystallizes in feathery aggregations. On prolonged keeping it is prone to undergo decomposition, but it keeps permanently in alcoholic solution. It volatilizes gradually at ordinary temperature and readily with steam.

Oxycamphor, being decomposed on prolonged exposure to the air, is marketed only in the form of the 50 per cent. alcoholic solution under the name of "oxaphor."

Oxaphor should be completely soluble in alcohol and in benzene, forming clear solutions. Its filtered aqueous solution after acidulation with nitric acid should not afford a precipitate with silver nitrate or barium chloride. When incinerated it should yield no weighable residue.

Actions and Uses.—Oxaphor is a depressant to the respiratory center, but is said to have no effect on circulation and secretion.

It is said to be useful as a substitute for morphine in respiratory disorders, chiefly in cardiac dyspnea and asthma. It is said to have been used with advantage in renal affections, in emphysema, bronchitis, etc. Freedom from undesirable side-effects is claimed as an advantage over morphine.

Dosage.—2 to 3 Gm. (30 to 45 grains) of oxaphor in a little water, wine, syrup or other desirable adjuvant.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 610,361 (Sept. 6, 1898; expires 1915).

OXYNTIN.—Oxyntin is a compound of protein and hydrochloric acid containing 5 per cent. hydrogen chloride (absolute hydrochloric acid) in unstable combination.

Oxyntin is prepared by combining hydrochloric acid with the albumin of fresh egg, desiccating the product at low temperature, and standardizing it to a uniform content of hydrochloric acid.

Oxyntin is a dry, granular powder, readily miscible with water, to which it imparts but a slightly acidulous taste.

The method of assay by which the acidity is determined is as follows:

1. About 1 Gm. oxyntin is weighed and mixed with 20 to 25 Cc. water and then titrated with standard sodium hydroxide, phenolphthalein being used as the indicator, and the result calculated to hydrogen chloride.

2. (a) About 3 Gm. oxyntin is weighed moistened with sodium carbonate solution in excess, dried, charred and extracted with hot water until free from chloride. The extract is slightly acidified with nitric acid and neutralized by the addition of an excess of calcium carbonate. This solution is titrated with standard silver nitrate potassium chromate being used as an indicator. From this result the total chloride content of oxyntin is calculated.

(b) About 3 Gm. oxyntin is weighed and treated as in 2 (a), the addition of sodium carbonate being omitted. From this result the fixed chloride is calculated.

The volatile chloride is calculated from the difference in the results between (a) and (b), and expressed as hydrogen chloride.

Actions and Uses.—Oxyntin is said to be useful as a substitute for dilute hydrochloric acid in the digestion of protein.

Dosage.—Being one-half the strength of diluted hydrochloric acid, U. S. P., oxyntin may be given 0.3 to 1.0 Gm. (5 to 15 grains) dry upon the tongue or in capsules, followed by a draught of water; or mixed with two or three tablespoonfuls of cold water, plain or sweetened to taste.

Manufactured by Fairchild Bros. & Foster, New York. U. S. trademark No. 50,968.

PARA COTO—(Coto[1]).—Para Coto is the bark of an undetermined South American tree, probably a species of Cryptocarya.

Para Coto occurs in pieces which are of considerable size and thickness, 30 cm. (12 in.) wide and 1.5 cm. (⅝ in.) thick. The outer surface is of reddish-brown or cinnamon-brown color. It is sometimes fissured longitudinally and transversely, and sometimes nearly smooth, with occasional patches of whitish cork. The inner surface is coarsely striated. It breaks with a fibrous, splintery fracture, and the smoothed transverse section exhibits a thin, brown cork within, which is a narrow cortex separated by a line of sclerenchymatous cells from the very thick bast, which is well characterized by the presence of abundant groups of sclerenchymatous cells. The odor is spicy and characteristic, the taste

1. While commercially, Para coto and coto are sold indiscriminately, botanists make a definite distinction between them.

aromatic and pungent. (Para coto is exported from Para at the mouth of the Amazon, and should therefore be called Para coto and not paracoto.)

The chief constituent of Para coto is paracotoin, an indifferent crystalline, bitter principle along with hydrocotoin, methyl hydrocotoin protocotoin, methyl protocotoin (oxyleucotoin), phenyl coumarin, piperonylic acid, volatile oil, resin and tannin.

Para coto is distinguished from coto by the action of nitric acid on the ether extractive matter. In the case of Para coto the result is the formation of a yellow color and in the case of coto a red color appears.

Actions and Uses.—Paracotoin is irritant to the gastrointestinal tract and is similar to cotoin but is weaker. Para coto is used like coto as an appetizer and for diarrhea and dysentery and similar disorders.

Dosage.—0.05 to 0.5 Gm. (1 to 8 grains).

PARACOTOIN.—Paracotoin is a principle, $C_{12}H_8O_4$, from Para coto.

Para coto is extracted with ether and the ether extract distilled. The residue is fractionated by repeated crystallizations from hot alcohol. The first body to separate out is paracotoin.

Paracotoin is a pale yellow, crystalline body, neutral in reaction, tasteless and odorless, melting at 149°-152° C. (300.2°-305.6° F.). It is difficultly soluble in water, but easily in ether, chloroform and boiling alcohol. Concentrated sulphuric and nitric acids dissolve it, forming a yellowish-brown solution. On boiling with a solution of caustic alkalies, a colorless crystalline body, melting at 82°-83° C. (179.6°-181.4° F.), and having the odor of coumarin is formed; this body is acetopiperon (paracumarhydrin) $C_8H_8O_3$ or $C_6H_3{<}\begin{matrix}O\\O\end{matrix}{>}CH_2.CO.CH_3$, and paracotoic acid $C_{12}H_{10}O_5$ a yellow amorphous mass melting at 108° C. (226.4° F.). Paracotoin fused with potassium hydroxide yields principally piperonylic acid $C_8H_6O_4$.

1 Gm. of paracotoin shaken up with 10 Cc. of fuming hydrobromic acid forms a semi-solid mass of yellow crystals, which on drying over potassium hydroxide lose hydrobromic acid. This residue decomposed with water and recrystallized forms paracotoin, recognized by its crystalline form and melting point.

By gradually adding about 1 Gm. paracotoin to about 10 Cc. concentrated nitric acid, a red-brown solution will result, which, when heated for a short time on the water bath and cooled, deposits a yellow crystalline mass. This product recrystallized from acetone and then from benzene or glacial acetic acid forms golden yellow crystals, melting at 195° C. (323.0° F.). This body is dinitro paracotoin, probably of the formula $C_{12}H_6$ $(NO_2)_2O_4$.

An excess of bromine added to a 10 per cent. solution of paracotoin in chloroform cooled to 0° C. produces a deep yellow precipitate, which loses hydrobromic acid, and when recrystallized from alcohol forms the mono-bromide of paracotoin ($C_{12}H_7BrO_4$), melting at 200°-201° C. (392°-393.8° F.).

Actions and Uses.—See para coto.

Dosage.—0.06 to 0.18 Gm. (1 to 3 grains).

Actions, Uses and Dosage.—Bitter stomachic, 0.002 to 0.02 Gm. (1/30 to 1/3 grain) before meals.

PERHYDROL—Thirty per cent. Solution of Hydrogen Dioxide.—Perhydrol is a 30 per cent. solution of hydrogen dioxide which is free from acid.

While perhydrol is stable, dilutions of perhydrol rapidly deteriorate unless they are preserved by the addition of some acid.

Actions and Uses.—By suitable dilution a preparation is obtained equivalent to the official solution of hydrogen dioxide. An advantage is claimed for this preparation that it is less irritating on account of the absence of acid. The full strength preparation is said to be useful as an application to nevi, ulcers, gummata, etc. Diluted one-half to two-thirds, it may be applied to syphilitic ulcers, gangrenous processes, ulcerating buboes, in endometritis, suppuration of the middle ear, etc.

Manufactured by E. Merck, Darmstadt, Germany. (Merck & Co., New York). U. S. trademark No. 44,147.

PHENOCOLL HYDROCHLORIDE — Aminoacetphenetidini Hydrochloridum. — Glycocoll-Paraphenetidin Hydrochloride — Phenamine.—Phenocoll hydrochloride is the hydrochloride of amino - acet - phenetidin, $C_6H_3.OC_2H_5.NH(CH_2NH_2.CO)\,HCl$ = $C_{12}H_{17}O_2N_2.HCl$, a synthetic base produced by the combination of phenetidin (paraamidophenetol) and glycocoll (aminoacetic acid). Amino acet-phenetidin (phenocoll), $C_6H_3.OC_2H_5.NH(CH_2NH_2.CO)$, differs from acetphenetidin (phenacetin), $C_6H_4.OC_2H_5.NH(CH_3.CO)$, in that one hydrogen atom in the acetyl group has been replaced by the NH_2 group.

It is prepared by the action of chloracetylchloride on phenetidin, treating the product of the reaction with ammonia, neutralizing the aminoacetphenetidin (phenocoll) so produced with hydrochloric acid, and crystallization.

It is a white, microcrystalline powder, soluble in 16 parts of water at the ordinary temperature, more soluble in hot water, from which it crystallizes in cubes, while from hot alcoholic solution it crystallizes in needles. It is barely soluble in chloroform, ether or benzene (benzol). The free base (phenocoll) obtained by precipitating the aqueous solution with fixed alkalies or their carbonates forms white, matted needles, containing one molecule of water. In its hydrated condition it melts at 95° C. (203° F.), while the anhydrous base melts at 100.5° C. (212.9° F.). It is stable and not chemically affected by acids or alkalies unless subjected to prolonged boiling with these reagents, by which phenocoll is split into phenetidin and glycocoll.

It should produce a clear solution with 30 parts of water, a turbidity indicating the presence of di- or tri-phenocoll, and the solution should not produce a red color with ferric chloride, showing absence of free phenetidin. No ammonia should be evolved on the addition of sodium hydroxide to the warm solution, and the precipitated base should be of a pure white color.

Phenocoll hydrochloride is incompatible with soluble hydroxides or carbonates.

Actions and Uses.—Phenocoll hydrochloride is similar to acetphenetidin (phenacetin) in its effects and acts as an antineuralgic and antipyretic. It is claimed by some observers to be less depressing than other antipyretics derived from aniline, such as acetanilid and acetphenetidin. It has been asserted to have an antiperiodic action and to be efficient as a substitute for quinine in malaria and free from unpleasant by-effects. Its use for this purpose is, however, to be deprecated, for it obviously obscures the symptoms only and does not destroy the malarial parasite. In somewhat larger doses than are usually employed it is said to have a beneficial action in rheumatic fever, but is both more dangerous and less efficient than the salicylates. See Acetphenetidin.

Dosage.—0.3 to 1.3 Gm. (5 to 20 grains) in powder, dissolved in water before taking; hypodermically, in 0.25 to 0.5 Gm. (4 to 8 grains) doses.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 543,214 (July 23, 1895; expires 1912).

PHENOCOLL SALICYLATE.—Phenocoll salicylate, $C_6H_3.OC_2H_5.NH(CH_2NH_2.CO).C_6H_4.OH.COOH = C_{17}H_{20}O_4N_2$, is the salicylate of the synthetic base phenocoll (see phenocoll hydrochloride).

It is prepared by neutralizing a hot aqueous solution of salicylic acid with phenocoll (obtained as described under phenocoll hydrochloride) and cooling the solution.

It forms fine, white, crystalline needles, having a sweetish taste, sparingly soluble in cold water (1 :200), readily soluble in hot water. It gives a violet reaction with ferric chloride.

It is incompatible with soluble hydroxides and carbonates and with bodies which are incompatible with the salicylates in general.

Actions and Uses.—It combines the therapeutic action of phenocoll (antipyretic, analgesic, see phenocoll hydrochloride) with those of salicylic acid (antiseptic, antirheumatic).

It is said to be useful in rheumatism, gout, chorea, pleuritis and fevers, especially in influenza, but is more toxic than the salicylates alone.

Dosage.—1 to 2 Gm. (15 to 30 grains).

PHENOLPHTHALEIN.—Phenolphthalein,

$$CO{<}\begin{matrix}C_6H_4\\O\\C_6H_4\end{matrix}{>}C{<}\begin{matrix}C_6H_4OH\\C_6H_4OH\end{matrix} = C_{20}H_{14}O_4$$ is a product of the interaction of phenol and phthalic anhydride.

It may be prepared by heating together 10 parts of phenol 5 parts of phthalic anhydride and 4 parts of concentrated sulphuric acid for 10 to 12 hours at 115° to 120° C. (239° to 248° F.). The product of the reaction is boiled with water, and the residue dissolved in soda lye. From this solution the phenolphthalein is precipitated by the addition of acetic acid. The precipitate after washing is dissolved in six times its weight of absolute alcohol and the solution decolorized by animal charcoal. A part of the alcohol is then distilled, the mixture filtered and the phenolphthalein separated from the filtrate by the addition of water.

Phenolphthalein occurs as a crystalline or amorphous powder, white or grayish-white, melting at 250° to 253° C. (482° to 487.4° F.). It is soluble in 600 parts of water and in 10 of alcohol. Its solutions in acid liquids are colorless, but turn red when the liquid is alkaline. The red color of the solution disappears if it be boiled with zinc dust, phenolphthalin, $C_{20}H_{16}O_4$, being formed.

Phenolphthalein heated on platinum foil should burn, leaving no residue.

Actions and Uses.—Phenolphthalein acts as a purgative, but appears to possess no further physiologic action. A case of poisoning from taking 1 Gm. (15 grains) is reported.

Dosage.—For adults the average dose is 0.1 to 0.2 Gm. (1.5 to 3 grains) given as powder, in cachets, capsules or pills. It may be given with safety in doses of 0.5 Gm. (8 grains), and these doses seem to be necessary to secure its effects in bedridden patients or in obstinate cases.

PHLORIDZIN—Phloridzinum.—Phlorizin.—Phloridzin is a glucoside, $C_{21}H_{24}O_{10} + 2H_2O$, from the root of the apple, pear, cherry, etc.

Phloridzin occurs as minute white slightly pinkish crystals, of a silky texture, or as a pale yellow light crystalline powder,

odorless and having a bitter but later a sweet taste. It is sparingly soluble in cold but freely soluble in hot water, from which it crystallizes on cooling. It is soluble in alcohol (1-4) and sparingly soluble in ether. The solutions are levogyrate. At 100° C. (212° F.) it loses water and at 107° C. (224.6° F.) melts When heated to 130° C. (266° F.) it becomes solid again and then melts again at 17° (338° F.). At 200° (392° F.) it assumes a red color, due to the formation of rufin.

Boiled with dilute acids it is converted into sugar, phlorose and phloretine. Exposed to air in the presence of ammonia it assumes a purple color. Cold concentrated sulphuric acid dissolves it to a yellow solution and at 25°-50° C. (77°-122° F.) it becomes red.

Action and Uses.—Phloridzin destroys malarial parasites. When administered to man or animals, it produces glycosuria of renal origin. Polyuria is also produced. It has been recommended as an antiperiodic in malaria, but its use is not justified in view of the possible injury to the kidney which it may cause. It is used as a means of testing the functional activity of the kidney.

Dosage.—To test the permeability of the kidney 0.005 Gm. (1-12 grain) is dissolved in 1 Cc. (15 minims) of a 0.5 per cent. solution of sodium carbonate and injected hypodermically. Glucose should appear in the urine in from 15 minutes to one-half hour and the secretion of sugar should continue for from two to four hours. The test gains in diagnostic value if the urine of each kidney is collected separately. Phloridzin may be given per os in pills massed with glucose syrup or suspended in a mixture with acacia or tragacanth. The internal dose is 0.3 to 0.6 Gm. (5 to 10 grains).

PICRIC ACID—Acidum Picricum.—Acidum Picricum (Pharm. Française, 1908). Picric acid is 2,4,6-tri-nitro-1-phenol, $C_6H_3O_7N_3$ or $C_6H_2OH.(NO_2)_3(1:2:4:6)$, an acid obtained by nitrating phenol.

Picric acid occurs as orthorhombic yellow prisms, odorless, but with a very bitter taste, with a specific gravity of 1.81 and melting at 122° C. (251.6° F.). It is explosive when heated to a high temperature. It is slightly soluble in cold water, imparting a yellow color to a very large volume of water. It is soluble in 81 parts water at 20° and in 25 parts at 80°. It is easily soluble in alcohol and in 5.7 parts of dry pure ether it dissolves to an almost colorless solution. (Pharm. Française, edit. 1908.)

Aqueous solutions dye organic matter, such as silk, wool and skin a characteristic yellow, but do not dye vegetable fibre.

1 part picric acid dissolved in 9 parts water at 60° C. and a warm solution of 2 parts potassium cyanide in 4 parts water when mixed give a red color. This solution on being cooled yields reddish brown plates of potassium picrocyanin or isopurpuric acid $C_8H_4KN_5O_8$.

Ammonium sulphide produces a red color in solutions of picric acid which becomes deeper on heating. (Pharm. Française, edit. 1908.)

The absence of salts of picric acid is demonstrated by its complete solubility in ether. (Pharm. Française, edit. 1908.)

Action and Uses.—Picric acid is an irritant to the skin and mucous membranes. Taken internally, it may produce nausea, vomiting and diarrhea. The urine is colored red or yellow and may show signs of nephritis. The skin and mucous membranes may be stained yellow and thus jaundice may be simulated. Red blood cells are partly dissolved and the white cells are increased in number. It is said to be a very useful application for burns, but the application has been said to be painful in certain cases. Toxic symptoms have been produced in some instances, especially in children, by absorption through the skin.

Dosage.—0.025 to 0.1 Gm. (½ to 2 grains). A solution containing 6 parts of picric acid, 60 parts of alcohol to 1,000 parts of water has been recommended for local application.

PIPERAZINE COMPOUNDS

PIPERAZINE—Piperazina. — Diethylenediamine.—Ethyleneimine.—Piperazine, $NH\langle{}^{CH_2.CH_2}_{CH_2.CH_2}\rangle NH + 6H_2O = C_4H_{10}N_2 + 6H_2O$, is a synthetic base obtained by the condensation of two $.CH_2CH_2.$ groups, with two :NH groups, containing 6 molecules of water of crystallization.

It is prepared by the interaction of ammonia on ethylene chloride, treating the complex mixture of different salts produced with sodium nitrate at 60° to 70° C. (140° to 158° F.), purifying the sparingly soluble dinitroso-piperazine, which separates as a scaly crystalline mass, by repeated crystallizations from hot water, and subjecting the pure dinitroso-piperazine so obtained to distillation with an alkali. It is also prepared by several other patented processes.

It forms colorless, lustrous, tabular crystals, hygroscopic, which melt at 44° C. (111.2° F.). It is extremely soluble in water, forming strongly alkaline but non-caustic solutions. It is not so readily soluble in alcohol. It is volatile. It forms soluble salts with acids, and with uric acid it forms a very soluble salt (in 50 parts of water; lithium urate requires 368 parts of water). It is not affected by chromic acid, but is slowly oxidized by potassium permanganate.

In aqueous solution it gives a characteristic scarlet-red precipitate with potassium-bismuth iodide, a white precipitate with Nessler's reagent, and is precipitated light blue by copper sulphate, white by mercuric chloride, lemon-yellow (crystalline) by picric acid and grayish by tannic acid.

It is incompatible with acetanilide, acetphenetidin (phenacetin), alkaloidal salts, nitrites, metallic salts in general and with picric and tannic acids. It should not be exposed to moisture.

Actions and Uses.—A part of the piperazine ingested passes undecomposed into the urine and is claimed by some to form a very soluble compound with the urinary uric acid; others state that the piperazine which is excreted is largely in combination with the stronger mineral acids. It has been shown that urine containing piperazine has no greater solvent power on uric acid than ordinary urine. Piperazine seems to produce no symptoms in man or animals, even when administered in fairly large quantities, although it is stated that, after large doses, tremors, clonic spasms and general depression have occurred.

Piperazine is claimed by the manufacturer to be useful in the prevention of the formation of renal and vesical calculi and for the relief of irritation of the bladder due to excess of urie acid in the urine and in cases of chronic gout, rheumatism, renal colic, etc. The attempt to secure the solution of uric acid in the body by this as well as other remedies has not been successful in the experience of many clinicians. There is no reliable evidence to warrant the acceptance of these claims.

Dosage.—0.3 to 0.6 Gm. (5 to 10 grains); daily dose, 1 to 2 Gm. (15 to 30 grains). Owing to its hygroscopic character, it is impracticable to dispense it in powder; it should, therefore, be dispensed in solution in water, plain or carbonated, but in quantities sufficient for a day's supply only.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 482,108 (expired). Also by Chemische Fabrik auf Actien vorm. E. Schering, Berlin (Schering & Glatz, New York). U. S. patent No. 543,214 (July 23, 1895; expires 1912).

Piperazine Tablets, 16 grains. Each tablet contains piperazine 1.03 Gm. (16 grains).

Prepared by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York).

LYCETOL.—Lycetol is dimethyl piperazine tartrate, $NH\langle{}^{CH(CH_3).CH_2}_{CH_2CH(CH_3)}\rangle NH + H_2C_4H_4O_6 = C_{10}H_{20}O_6N_2$, a tartrate of a methyl derivative of diethylenediamine (piperazine).

It is prepared by the distillation of glycerin with ammonium chloride or bromide, reduction of the dimethylpyrazine (isolated from the distillation products) with metallic sodium and converting the base so obtained, after purification, into the tartrate.

It is a white, odorless powder, melting at 250° C. (482° F.), anhydrous, but slightly hygroscopic. It is soluble in water, forming agreeably acidulous solutions.

It is incompatible with alkalies which liberate the insoluble free base.

Actions and Uses.—Lycetol is claimed to be a serviceable diuretic and uric acid solvent. It is said to be free from disturbing effects on the stomach and to be well tolerated for long periods.

Dosage.—1 to 2 Gm. (15 to 30 grains), well diluted, and preferably in carbonated water, sweetened with sugar if desired.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 523,018 (July 17, 1894; expires 1911). U. S. trademark No. 24,722.

SIDONAL—Piperazinæ Quinas.—Piperazine Quinate—Kinate of Piperazine.—Sidonal is piperazine quinate, $NH\langle{}^{CH_2CH_2}_{CH_2CH_2}\rangle NH.2C_6H_7(OH)_4(COOH) = C_{18}H_{34}N_2O_{12}$, the normal salt of piperazine and quinic acid.

It is prepared by heating 1 molecule of piperazine with 2 molecules of quinic acid and maintaining the mixture at its melting point for some time, or by dissolving equivalents of piperazine and quinic acid in the smallest practicable quantity of water,

concentrating the solution on a water bath, removing the residual water by repeated additions of small quantities of alcohol, evaporating and finally drying the residue in a vacuum.

It forms a white, crystalline powder, melting at 168° to 171° C. (334.4° to 339.8° F.), and having a faint acid taste and reaction. It is very soluble in water and forms salts on mixing the aqueous solution with solutions of alkali carbonates and evaporating to dryness.

It responds to tests for piperazine (precipitate with potassium-bismuth iodide, etc.) and quinic acid.

Its incompatibilities are those of the alkaloidal salts generally.

Actions and Uses.—Sidonal is said to be useful as a uric acid solvent in gout, neurasthenia, etc.

Dosage.—1 to 1.3 Gm. (15 to 20 grains) 5 or 6 times a day, dissolved in water.

Manufactured by Vereinigte Chemische Werke Actiengesellschaft, Charlottenburg, Germany (Victor Koechl & Co., New York). Eng. patent No. 11,420. U. S. patent No. 665,879 (Jan. 15, 1901; expires 1918). U. S. trademark No. 34,706.

POLLANTIN, FALL—Dunbar's Serum.—An antitoxic serum from horses treated with pollen toxin derived from ragweed.

Horses are injected with gradually increased doses of pollen toxin (derived from ragweed), which results in the formation of an antitoxin after two or three months of treatment. The horses are then bled and the strength of the serum is estimated by determining the proportion which will prevent the action of a solution of pollen toxin, of which one drop is barely sufficient to produce a reaction when instilled into the conjunctival sac of a hay-fever patient. The serum is preserved by the addition of 0.25 per cent of phenol.

It is a clear, slightly yellowish liquid, having the odor and taste of a dilute solution of phenol. On standing, the liquid deposits a slight precipitate. The liquid is alkaline in reaction and not irritating to the normal conjunctiva.

It should neutralize the effects of a solution of pollen toxin when mixed with it and dropped into the eye or when a drop is applied immediately after a drop of the toxin solution.

The liquid does not keep well if exposed to the air. When it becomes cloudy or a bad odor develops, decomposition has occurred and the preparation should no longer be used.

Actions and Uses.—It has no pharmacologic action except the neutralization of the pollen toxin. The serum is not intended for use hypodermically. It is employed for the relief of hay fever and it seems to be effective in a proportion of cases. It may be used as prophylactic.

Dosage.—One drop should be instilled by means of a pipette into the outer angle of each eye and one or two drops into one nostril, the other being kept closed, every morning before rising. If the first application causes sneezing or reddening of the mucous membrane of the eye, the directions are to repeat the application, even for the fourth time, if necessary.

Manufactured by Schimmel & Co., Miltitz, near Leipsic, Germany (Fritzsche Bros., New York). U. S. patent No. 745,333 (Dec. 1, 1903; expires 1920). U. S. trademark No. 40,562.

POLLANTIN POWDER, FALL.—A powder obtained by evaporating, *in vacuo*, pollantin serum derived from ragweed toxin at about 45° C. (113° F.) and mixing it with sterilized sugar of milk.

It is a fine, slightly yellowish, almost odorless powder, almost but not entirely soluble in water, and having a slight alkaline reaction. The tests are the same as for the liquid. It should reduce Fehling's solution. The powder keeps well.

Actions and Uses.—The same as those of the liquid.

Dosage.—The powder is applied to the eyes by dusting on the conjunctiva and to the nose by snuffing into one nostril, the other being closed, a piece as large as a lentil.

Manufactured by Schimmel & Co., Miltitz, near Leipsic, Germany (Fritsche Bros., New York). U. S. trademark No. 40,562.

POTASSIUM MERCURIC-IODIDE—Potassii Hydrargyro-iodidum.—Potassium mercuric-iodide is a complex salt formed by interaction of mercuric iodide with potassium iodide.

When mercuric iodide is added to an excess of potassium iodide solution a colorless liquid is obtained containing the mercuric iodide as a complex salt, approximately K_2HgI_4 (or $2KI + HgI_2$). Under suitable conditions (Naylor and Chappell, Pharm. J., Mar. 7, 1908, p. 315) the salt having the composition $K_2HgI_4 + 3H_2O$ (or $2KI + HgI_2 + 3H_2O$) may be obtained in yellow needle-shaped crystals.

Potassium mercuric-iodide is deliquescent and is decomposed by water.

Actions and Uses.—The same as mercuric iodide, over which it is claimed to have some advantages because of its solubility.

Proprietary Preparation:

SOLOID MERCURIC POTASSIUM IODIDE.—Tablets said to contain in each tablet mercuric potassium iodide (potassium mercuric-iodide) ($HgI_2 2KI = K_2HgI_4$) 0.113 Gm. (1.75 grains), an excess of potassium iodide, which prevents the decomposition of the potassium mercuric-iodide when water is added, and a trace of coloring matter.

Prepared by Burroughs-Wellcome & Co., London, England, and New York.

PROTAN—Tannin Nucleo-Proteid, Mulford—Protan is said to be a chemical combination of casein with tannic acid containing about 50 per cent. tannic acid.

It is made by adding a solution of tannic acid to an alkaline solution of casein, collecting and drying the precipitate. Protan is a light brown powder, tasteless, and free from astringent action on the mouth and stomach; insoluble in water or dilute acids, and does not coagulate albumen or precipitate pepsin or peptones.

When shaken with water and filtered, a colorless solution should be obtained, which should give not more than a faint trace of color with ferric chloride solution, showing absence of more than traces of free (uncombined) tannic acid.

The resistance of Protan to the action of the gastric juice may be shown by mixing 2 Gm. (dried at 100 degrees C.) with 40 Cc. 0.2 per cent. hydrochloric acid containing ten times the theoretical amount of 1:3000 pepsin necessary to digest the proteid present, warming to 40 degrees C. for six hours, filtering off the residue, drying and weighing; 60 to 70 per cent. of the amount taken may thus be recovered.

The tannin may best be determined by difference, the casein being determined by decomposing it by the Kjeldahl-Gunning method and estimating the nitrogen.

Actions and Uses.—It is employed as an intestinal astringent in all forms of diarrhea.

Dosage.—For infants and children, 0.3 to 0.6 Gm. (5 to 10 grains) every hour; in acute catarrhal diarrhea (cholera morbus), 1 to 2 Gm. (15 to 30 grains) every one or two hours; in chronic diarrhea, 1.3 to 2 Gm. (20 to 30 grains) every hour or two hours.

Manufactured by the H. K. Mulford Co., Philadelphia. Not patented. U. S. trademark No. 38,616.

Friable Tablets Protan, 2½ grains.—Each tablet contains protan, 0.16 Gm. (2½ grains).

Friable Tablets, Protan, 5 grains.—Each tablet contains protan, 0.32 Gm. (5 grains).

Friable Tablets, Protan, 7½ grains.—Each tablet contains protan, 0.48 Gm. (7½ grains).

Protan and Opium Tablets, No. 1.—Each tablet contains opium 0.005 Gm. (1/12 grain) and protan 0.162 Gm. (2½ grains).

Protan and Opium Tablets, No. 2.—Each tablet contains opium 0.03 Gm. (½ grain) and protan 0.5 Gm. (7½ grains).

PROTARGOL—Protein Silver Salt.—Protargol is a compound of albumin and silver containing 8.3 per cent. of silver in organic combination.

According to the patent specification insoluble protein silver compounds, obtained by treating protein bodies with silver salt, are rendered soluble by treatment with a solution of albumoses.

It is a light-brown powder, soluble in twice its weight of cold water, producing a solution which is not affected by the ordinary precipitants of silver salts, such as alkalies, sulphides, chlorides, bromides, iodides, nor by heat.

Ammonium sulphide gives a dark color to the solution without precipitation. Addition of strong hydrochloric acid produces a precipitate of unchanged protargol, soluble in a large quantity of water. A solution containing sulphuric acid is not colored blue by diphenylamine. It is compatible with picric acid and picrates and with most metallic salts. It should not be exposed to light. It is precipitated by cocaine hydrochloride, but this is prevented by addition of boric acid.

Actions and Uses.—Protargol is claimed to be a non-irritant bactericide and antiseptic. It is said to be useful in acute and chronic gonorrhea as a non-irritant substitute for silver nitrate and in diseases of the mucous membranes of the eye, ear, nose and throat, and particularly in the treatment of conjunctivitis.

Dosage.—From 0.25 or 1 per cent. solution in acute gonorrhea, to 5 or 10 per cent. instillations in chronic cases, in cystitis and urethritis; in solutions of 1:1000 to 1:2000 as irrigations. Used also in form of bougies and tampons (5 to 10 per cent.). Its solutions in water are made by pouring on the protargol a little *cold* water, stirring into a thick paste, and gradually adding the remainder of the water under stirring; or by sprinkling the protargol on the surface of the whole of the water (cold) and setting it aside until solution occurs.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 615,970 (Dec. 13, 1898; expires 1915). U. S. trademark No. 30,882.

PYRAMIDON.—Dimethylaminoantipyrina.—Pyramidon is phenyl-dimethyl-dimethylamino-pyrazolon,

$$C_6H_5N\begin{cases}CO\text{——}C.N(CH_3)_2\\ \\ N(CH_3).C(CH_3)\end{cases} = C_{13}H_{17}N_3O,$$

differing from antipyrine, $C_{11}H_{12}N_2O$, in that a dimethylamino group, $N(CH_3)_2$, has replaced a hydrogen atom of the pyrazolon nucleus.

It is prepared by the reduction of nitroso-antipyrine to amido-antipyrine and treating this with methyl chloride or iodide.

It forms small, colorless, slightly alkaline crystals, melting at 108° C. (226.4° F.); almost tasteless; soluble in 11 parts of cold water and readily soluble in alcohol, ether and benzene. Its aqueous solution saturated at 70° C. (158° F.) deposits oily globules of pyramidon on boiling.

Ferric chloride colors the neutral or slightly acidulated solution of pyramidon a bluish violet color; nitrous or nitric acid produces a fugitive blue-violet color; silver nitrate produces an intense violet coloration when added to the aqueous solution, followed by the formation of a black precipitate of metallic silver, and the same color is produced by platinum chloride, by ammonium persulphate and by lead dioxide. In hydrochloric acid solution pyramidon gives a fine crystalline double salt with mercuric chloride.

Its incompatibilities are in general the same as those of antipyrine. Oxidizing agents (also acacia) often produce colored solutions.

Actions and Uses.—Pyramidon acts as an antipyretic and anodyne, like antipyrine, but is effective in smaller doses. The action, while somewhat slower at the beginning, is more lasting. It is claimed to be devoid of harmful influences on the blood, heart or kidneys. It is said to be useful, particularly in the chronic fevers of tuberculosis, as well as in the acute febrile conditions incident to typhoid fever, erysipelas and pneumonia. In the treatment of infectious fevers, it, like other antipyretics, should be cautiously employed. See Acetphenetidin.

Dosage.—0.3 to 0.4 Gm. (5 to 6 grains), most conveniently in the form of tablets, a single dose usually sufficing for 24 hours.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 579,412 (March 23, 1897; expires 1914).

PYRAMIDON ACID CAMPHORATE.—Pyramidon acid camphorate, $C_{13}H_{17}N_3O.C_{10}H_{16}O_4$, is an acid salt of pyramidon and camphoric acid.

It is prepared under the same conditions as the neutral salt.

It is a white, crystalline powder of acid reaction, melting (indefinitely) at 84° to 94° C. (183.2° to 201.2° F.); soluble in 20 parts of water or in 4 parts of alcohol.

It gives the characteristic reaction of pyramidon (which see) with silver nitrate. If the solution in hot water is made alkaline with caustic soda, the pyramidon may be shaken out with chloroform; if the residual aqueous liquid is then acidified with sulphuric acid the camphoric acid (melting point 186° C., 366.8° F.) may be shaken out with ether.

Actions and Uses.—The acid and neutral salts combine the antipyretic action of pyramidon with the antihidrotic action of camphoric acid. It is claimed that in these compounds the respective action of the component is modified, the antihidrotic effect of the camphoric acid being materially increased, while the toxicity of the pyramidon is diminished; but the latter statement is hypothetical. In the neutral salt the antipyretic action of the pyramidon predominates; in the acid salt the antihidrotic effect of the camphoric acid.

They are said to be especially useful in the febrile conditions of phthisis, attended by profuse sweating. See Pyramidon.

Dosage.—0.75 to 1 Gm. (12 to 15 grains), given in powders or aqueous solution.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 686,999 (Nov. 19, 1901; expires 1918).

PYRAMIDON NEUTRAL CAMPHORATE.—Pyramidon neutral camphorate $(C_{13}H_{17}N_3O)_2.C_{10}H_{16}O_4$, is a neutral salt of pyramidon and camphoric acid.

It is prepared by combining its components with the aid of suitable solvents, under exclusion of light, moisture and heat.

It is a white, crystalline powder, melting (indefinitely) at 80° to 90° C. (176° to 194° F.). It dissolves with acid reaction in 15 parts of water or 2 parts of alcohol.

It gives the characteristic reaction of pyramidon (which see) with silver nitrate. If the solution in hot water is made alkaline with caustic soda, the pyramidon may be shaken out with chloroform; if the residual aqueous liquid is then acidified with sulphuric acid the camphoric acid (melting point 186° C., 366.8° F.) may be shaken out with ether.

Dosage.—Neutral camphorate, 0.5 to 0.75 Gm. (8 to 12 grains) given in powders or aqueous solution.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 686,998 (Nov. 19, 1901; expires 1918).

PYRAMIDON SALICYLATE.— Pyramidon salicylate, $C_{13}H_{17}N_3O.C_7H_6O_3$, is a salt of pyramidon and salicylic acid.

It is prepared by combining its components with the aid of a suitable solvent and avoidance of exposure to light, moisture and heat

It is a white, crystalline powder, having an acid reaction and melting indefinitely at 68° to 70° C. (154.4° to 158° F.). It is soluble in 16 parts of water or 5 to 6 parts of alcohol.

The aqueous solution is colored intensely red by ferric chloride, and produces a white precipitate with silver nitrate, the solution assuming a violet color after a short time.

It is incompatible with ferric salts.

Actions and Uses.—It is antipyretic, analgesic and antiseptic, combining the activity of its components.

It is said to be useful in rheumatic and gouty affections, neuralgia, pleuritis, etc. See Pyramidon.

Dosage.—0.5 to 0.75 Gm. (8 to 12 grains) in powder or aqueous solution.

Manufactured by Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 680,278 (Aug. 13, 1901; expires 1918).

PYROXYLIN

Pyroxylin is official in the United States Pharmacopœia. For description see the pharmacopeia or the Physicians' Manual of the Pharmacopeia and National Formulary.

CELLOIDIN.—A name applied to a preparation of the character of a purified Pyroxylin, U. S. P.

Celloidin is prepared by solution of pyroxylin in a mixture of alcohol and ether, filtration and recovering the solvent from the filtrate. It is supplied in shreds immersed in water.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 299,857 (expired).

QUASSIN[1]—Quassine (Pharm. Française, 1908)—**Quassinum**—Quassin is a bitter principle found in quassia.

The alcoholic extract of Jamaica quassia wood (Quassia U. S. P.) is neutralized with magnesia, then acidified with tartaric acid and the alcohol distilled off. The residue is shaken up with chloroform and the solution evaporated to syrupy consistency and dissved in a mixture of equal parts of absolute alcohol and ether. This solution is evaporated and the residue dissolved in as little absolute alcohol as possible, the solution covered with a layer of ether and allowed to evaporate. The crystals which form are recrystallized from alcohol. The product thus prepared consists of two bitter principles α-picrasmin ($C_{26}H_{36}O_{10}$) melting at 204° C. (399.2° F.) and β-picrasmin ($C_{26}H_{36}O_{10}$) melting at 209-212° C. (408.2° to 413.6° F.).

Quassin crystallizes in oblique rhomboidal needles with a pearly lustre. It is odorless, but has a bitter taste. Its melting point is 210° C. (410° F.) and cooling it forms an amorphous mass. It is soluble in about 400 parts of water at 15° C. (59° F.); in 30 parts alcohol (85 per cent.) and in 21 parts of cold chloroform. It is very soluble in boiling alcohol, in acetic acid, and very slightly soluble in ethyl and petroleum ethers. It is soluble in concentrated acids and alkalies, but not in alkaline carbonates. Continued action of alkalies forms resins (Pharm. Française, 1908). It is dextrorotatory in its chloroform solution; 4.22 gm. in 100 Cc. chloroform rotating the plane of polarized light to the right with a specific rotation of plus 38° 8'. Solutions of quassin are neutral.

It dissolves to a colorless solution in concentrated sulphuric acid, which becomes red on the addition of sugar. (Pharm. Française, 1908).

QUININE DERIVATIVES

ARISTOCHIN — Diquinine carbonic Ester.—Aristoquin—Carbonyl Quinine. — Aristochin is quinine carbonate, $CO(C_{20}H_{24}N_2O_2)_2 = C_{41}H_{48}N_4O_6$, the neutral carbonic acid ester of quinine.

It is prepared according to the patents by acting on quinin dissolved in pyridin or chloroform with carbonyl chloride or by heating together quinine and phenol carbonate in the proportion of one molecule of the latter to two molecules of the former.

It forms a white, absolutely tasteless powder, melting at 189° C. (372.2° F.) insoluble in water, difficultly soluble in alcohol, more soluble in warm alcohol and chloroform, very sparingly soluble in ether. It is capable of combining with one and two molecules of hydrochloric acid forming soluble salts. It is gradually decomposed by acids with liberation of quinine, thus acquiring a bitter taste; hence it is incompatible with acids.

It should be free from bitter taste. As it is decomposed by acids and alkalies with the formation of quinine, it should respond to tests for quinine after such treatment.

Actions and Uses.—The same as those of quinine, but, since it is only slowly acted on by acids, it is said not to produce disturbance of the stomach and to be much freer from tendency to production of cinchonism.

Dosage.—The same as that of quinine, in powder, mixed with milk sugar, dry on the tongue or suspended in liquids.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). German patents No. 105,666, 134,307 and 137,308. U. S. patent No. 625,675 (May 16, 1899; expires 1916).

1. Quassin (amorphous) is not identical with the above and should not be confounded with it.

CHINAPHENIN—Phenetidin Quinine Carbonic Acid Ester.—Chinaphenin is phenetidin quinine carbonate, $CO(NH.C_6H_4OC_2H_5)$ $(C_{20}H_{22}N_2O_2{=}C_{20}H_{24}N_2O_4$, the carbonic acid ester of phenetidin and quinine.

It is prepared by the action of quinin on p-ethoxyphenyl carbamic acid chloride.

It is a white, odorless and tasteless powder, difficultly soluble in water, but readily soluble in alcohol, ether, chloroform and benzene. Acids dissolve it with the formation of soluble salts.

It gives the thalleioquin reaction for quinine salts, but forms a yellow herapathite.

It is decomposed by acids with the liberation of quinine.

Actions and Uses.—Chinaphenin combines the antiperiodic properties of quinine with the analgesic power of acetphenetidin (phenacetin), with the advantage of tastelessness and asserted freedom from symptoms of cinchonism. It has been recommended in febrile diseases, especially la grippe; in spasmodic conditions, such as whooping-cough; in certain forms of malaria and in neuralgia.

Dosage.—Adult: 0.3 to 0.6 Gm. (5 to 10 grains) ordinarily, or 1.5 to 2 Gm. (22 to 30 grains), given in two doses as an antipyretic in neuralgia and malaria; in whooping-cough, 0.13 to 0.3 Gm. (2 to 5 grains), according to age.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 637,839 (Nov. 28, 1899; expires 1916). Vereinigte Chininfabriken. Zimmer & Co., Frankfort a. M., Germany. German patent No. 109,259.

EUQUININE—Quininæ Æthylcarbonas.—Quinine Ethyl Carbonate—Euchinin.—Euquinine is quinine ethyl carbonate, $C_2H_5O.CO.OC_{20}H_{23}N_2O{=}C_{22}H_{28}O_4N_2$, the quinine ester of ethyl Carbonic acid ester.

It is prepared by the action of chlorocarbonic ethyl ester on quinine, $C_2H_5O.COCl + C_{20}H_{24}N_2O_2{=}HCl + C_2H_5O.COO.C_{20}H_{23}N_2O$.

It is a light, fleecy conglomeration of delicate, white needles, melting at 95° C. (203° F.) and practically tasteless. It is sparingly soluble in water, but readily soluble in alcohol, ether and chloroform. It is slightly alkaline in reaction, forming well crystallizable, bitter salts with acids. It produces a tasteless tannate.

Its solutions in acidulated water have the characteristic bitter taste of quinine. On heating a mixture of 0.2 Gm. of euquinine, 3 Cc. of solution of sodium hydroxide and a little iodine, the odor of iodoform is manifested. Like quinine its solution in dilute sulphuric acid exhibits strong, blue fluorescence, and it gives also the so-called thalleioquin reaction, but not the herapathite reaction. A solution in nitric acid should not change on addition of either silver nitrate or barium chloride.

It should leave no residue on combustion.

It is incompatible with acids which will develop the bitter quinine taste.

Actions and Uses.—Euquinine is claimed to have the same action as quinine, with the advantage of being tasteless, owing to its insolubility in water and alkaline media.

Dosage.—The same as quinine.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany (Merck & Co., New York). U. S. patent No. 585,068 (June 22, 1897; expires 1914). U. S. trademarks Nos. 640,977 and 701,523.

QUININE LYGOSINATE—Quininæ Lygosinas.—Quinine lygosinate. $CO(CH{:}CH.C_6H_4.C_{20}H_{24}N_2O_2)_2{=}C_{37}H_{36}N_4O_6$, is a quinine compound of dioxy-dibenzal-acetone.

It is prepared by the reaction of quinine hydrochloride with sodium lygosinate.

Quinine lygosinate is a fine, orange yellow, amorphous powder, melting at 114° C. (237.2° F.), having a faintly aromatic odor and a bitter taste, which is gradually developed on account of its sparing solubility in water. It is slightly soluble in water, soluble in 6 parts of alcohol, in 20 parts of hot oil and readily soluble in chloroform and benzene. It is decomposed by acids and alkalies. It contains 70.8 per cent. of quinine.

Burned on platinum foil, quinine lygosinate develops the odor of bitter almonds and leaves no residue. Its alcoholic solution dyes cotton gauze a bright yellow color, which becomes red-brown on drying.

If 1 Gm. quinine lygosinate be shaken with 20 Gm. of 20 per cent. sodium hydroxide solution and extracted twice with 10 Gm. of ether, the quinine remaining after evaporation of the ether should not weigh less than 0.7 Gm. If the alkaline solution thus obtained be acidified, lygosin separates as a thick yellow precipitate.

It is incompatible with acids and alkalies.

Actions and Uses.—It is stated that this preparation is capable of preventing completely the development of cultures of staphylococcus. Given to rabbits by mouth in doses of 1 Gm. per kilo of the body weight it is said to be entirely harmless. It is claimed to be a styptic useful in parenchymatous hemorrhages and free from unfavorable side effects, such as cauterization of the wound surfaces.

Dosage.—It is employed as a dusting powder, in bandages, gauzes, suppositories, in the form of court plaster and in glycerin suspensions.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany. (C. Bischoff & Co., New York.)

QUININE AND UREA HYDROCHLORIDE.—Quininæ et Ureae Hydrochloridum.—Chininum bihydrochloricum Carbamidum. — Quinine and urea hydrochloride, $C_{20}H_{24}N_2O_2.HCl + CH_4N_2O.HCl + 5H_2O$, is a compound of quinine hydrochloride and urea hydrochloride containing approximately 60 per cent. of anhydrous quinine.

Quinin and urea hydrochloride is prepared by dissolving 400 parts quinin hydrochloride in 300 parts of dilute hydrochloric acid, sp. gr. 1.061, mixing the solution with 60 to 61 parts of pure urea $CO(NH_2)_2$ warming the mixture until dissolved, filtering it through glass wool and setting the filtrate aside for crystallization. After twenty-four hours the crystals are brought on a filter, drained, washed with very cold distilled water, spread on flat plates and dried at room temperature. The mother liquor is evaporated and again set aside for crystallization. The second mother liquor which is colored brown is exposed in a dish to spontaneous evaporation, during which all of the double salt of quinine slowly crystallizes out and may be separated.

The hydrochloride of quinine and urea crystallizes from hot solutions in hard white interlaced four sided prisms. On spontaneous evaporation of a concentrated solution very large transparent prisms are formed. The salt dissolves at ordinary temperature in its own weight of water forming a somewhat viscid straw colored liquid, not altered by exposure to light. During its solution a marked lowering of temperature occurs.

It is not hygroscopic and is unalterable in the air excepting when warmed, the crystals lose their transparency and become yellowish. They fuse at from 70° to 75° C. (158° to 167° F.) with the loss of 10 per cent. of water forming a yellowish liquid which congeals on cooling to a yellow mass. If this mass is allowed to stand in the air it takes up after a few days the whole amount of water expelled and becomes again white. If the melted salt is dissolved in water it may be completely recovered in a crystalline form. It is also soluble in alcohol and from this solution a salt of somewhat variable composition is precipitated by ether.

It is soluble in about 800 parts of chloroform.

Its aqueous solutions are of a strong acid reaction.

A solution of the salt in water 1 to 20 shows no fluorescence, but if one drop of this solution is added to 10 Cc. of distilled water in a test tube a vivid blue fluorescence is developed.

On drying the salt at 125 C. to constant weight and cooling in a desiccator, it should not lose more than 16.5 per cent. of its weight (corresponding to five molecules of water of crystallization).

On ignition the pure salt is slowly consumed, leaving no residue.

Ammonia water, alkaline hydroxides or alkali carbonates throw down from the aqueous solution of quinine and urea hydrochloride a white precipitate of alkaloidal quinine, which when carefully washed with cold distilled water until free from chlorides and dried at a low temperature, should conform to the reactions and tests given in the United States Pharmacopeia under quinine. One gramme dissolved in 2 Cc. of distilled water and well shaken in a stoppered test tube with 6 Cc. of ether and 2 Cc. of 10 per cent. ammonia water should be dissolved completely and no crystals should separate out from the ethereal solution on standing for six hours. If the ethereal stratum is removed to a tared beaker and the contents of the test tube washed successively with three portions of 5 Cc. each of ether and these ether washings also added to the tared beaker, the alkaloidal quinine remaining after evaporating off the ether, dried at 125 C. to constant weight, should weigh not less than 0.592 Gm.

If 2 Gm. of the salt be dissolved in a test tube in 4 Cc. of distilled water, the solution cooled and 4 Cc. of nitric acid U. S. P. (free from nitrous acid) be added, the solution quickly cooled again in ice water and the cold mixture set aside at a low temperature, separation of crystals will commence after a few minutes and crystallization will be completed after the solution has stood in a cold place over night. The crystals may be separated by the use of a small glass funnel provided with a pellet of glass wool. The test tube should be washed with three portions of 2 Cc. each of cold diluted nitric acid 1 and 1 and the acid carefully poured over the crystals in the funnel, drop by drop, to remove all traces of quinin. The remaining crystals should consist of urea nitrate. This is demonstrated by taking 3 Cc. of water, heating in the test tube in which the crystals have been crystallized, and after carefully draining off the acid which may be held back by the stem of the funnel, pouring the hot water slowly on the crystals in the funnels and repeating with another 2 Cc. of hot water. The resulting well-mixed solution is divided into two equal parts in two test tubes and cooled. To the first is added from a pipette 10 drops of solution of mercuric nitrate, U. S. P., and then, gradually, normal solution of sodium hydroxide until only a slightly acid reaction is obtained, when a copious white precipitate should result.

The second part of the filtrate is made strongly alkaline by the use of a solution of sodium hydroxide, 1 in 4, and to the resulting clear liquid is added 2 Cc. of a strong solution of sodium hypochlorite. The mixture is warmed to about 40 C., when a development of gas will take place at once.

Actions and Uses.—Quinine and urea hydrochloride has the actions of quinine. It is non-irritating when injected hypodermically. Recent investigations have shown that when injected hypodermically or when applied locally to mucous membranes it exerts an anesthetic action similar to that of cocaine. It is reported that the anesthesia is in some cases prolonged for several days.

Quinine and urea hydrochloride is said to be especially useful in the treatment of malaria by hypodermic injections. It has also been applied as a substitute for cocaine in the production of local anesthesia for operations.

Dosage.—The same as Quinine. For the production of local anesthesia injections of a solution of from ¼ to 1 per cent. strength are used. The ¼ per cent. solution is said to be free from the risk of producing fibrous indurations, which sometimes occurs with the stronger solution. For application to mucous membranes solutions varying in strength from 10 to 20 per cent. should be used.

SALOQUININE—Quinine Salicylic Ester.—Salochinin—Salicylquinine.—Saloquinine is quinine salicylate, $C_6H_4.OH.COO(C_{20}H_{23}N_2O)=C_{27}H_{28}O_4N_2$, the salicylic acid ester of quinine, containing 73.1 per cent. of quinine.

According to the patent specifications it is obtained by heating a mixture of phenyl salicylate (salol) with anhydrous quinine to 170° to 190° C. (338° to 374° F.) in a vacuum, whereby quinine salicylic acid ester and phenol are formed. The phenol set free is removed by distillation and the residue washed with dilute acetic acid to remove unchanged quinine.

It is a white, crystalline powder, melting at 138° C. (280.4° F.), perfectly tasteless and odorless. It is insoluble in water, soluble in acidulated water and moderately soluble in alcohol and in ether. It forms neutral salts which are tasteless, and acid salts.

Its acid solutions are precipitated by alkalies and the usual alkaloidal reagents. The filtrate obtained after shaking saloquinine with water, does not give a violet color with ferric chloride (absence of free salicylic acid).

It is incompatible with acids.

Actions and Uses.—It is a tasteless substitute for quinine and salicylic acid.

Dosage.—0.5 to 2 Gm. (8 to 30 grains).

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Merck & Co., New York). U. S. patent No. 678,401 (July 16, 1901; expires 1918). U. S. trademark No. 37,373 (salochinin), No. 37,374 (saloquinine).

SALOQUININE SALICYLATE. — Saloquinine salicylate $C_6H_4.OH.COO(C_{20}H_{23}N_2O).C_6H_4OH.COOH=C_{34}H_{34}N_2O_5$, is the salicylate of the salicylic acid ester of quinine.

It is prepared by the addition of salicylic acid to a hot alcoholic solution of salicylic acid ester of quinine (see saloquinine) and collection of the crystals which separate out on cooling.

It is a white, tasteless powder, melting at 182° to 183° C. (359.6° to 361.4° F.), sparingly soluble in water, soluble in benzene, chloroform and hot alcohol.

It is incompatible with alkaline liquids.

Actions and Uses.—It has been recommended in acute rheumatism, neuralgia, tabes, gonorrheal inflammations, etc.

Dosage.—1 Gm. (15 grains).

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 698,079 (April 22, 1902; expires 1919).

RED GUM—Eucalypti Gummi.—Eucalyptus gum. Eucalyptus Kino.

Red gum is an exudation from the bark of Eucalyptus rostrata, Schlecht, and other species of Eucalyptus.

Red gum occurs in small, dark reddish brown, opaque and more or less dusty pieces which yield a pale red powder. It is usually collected from artificial incisions. When chewed it is tough, and colors the saliva red. Water dissolves 80-90 per cent. Its chief constituent is tannic acid, to the extent of 47 per cent.

Action and Uses.—Red gum is an active astringent. It is used as an astringent in sore throat, diarrhea and in catarrhal affections of various mucous membranes. Largely used in the form of lozenges where an astringent is needed in throat affections.

Dosage.—0.1 to 0.3 Gm. (2 to 5 grains).

SABROMIN — **Dibromebehenate of Calcium.** — Sabromin, $(C_{21}H_{41}Br_2COO)_2Ca=C_{44}H_{82}O_4Br_4Ca$, is the calcium salt of dibrombehenic acid.

It is prepared from erucic acid by the addition of bromine and transformation of the diobrombehenic acid thus obtained into the calcium salt.

Sabromin is a colorless, odorless and tasteless powder claimed to contain about 29 per cent. bromin and about 6.8 per cent. calcium. It is insoluble in water and alcohol, soluble in ether, acetone, benzol, ligroin and tetrachloride of carbon. On heating on platinum foil it is decomposed with liberation of bromine.

Tests: Sabromin is recognized by its solubilities and the liberation of bromine on heating.

Action and Uses.—Sabromin is converted in the stomach into dibrombehenic acid, a substance which is free from any action on that organ, but which is absorbed from the intestine. Its effect is less rapid than that of the bromides, but more prolonged. It is said to be devoid of the disadvantages of the bromides, such as their unpleasant taste, irritating action on the stomach, and systemic by-effects.

Sabromin is indicated in the same class of cases in which the bromides are useful.

Dosage.—The dose is about the same as that of potassium bromide.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 848,230 (March 26, 1907; expires 1924).

Sabromin Tablets, 8 grains.—Each tablet contains sabromin 0.5 Gm. (8 grains).

SAJODIN—Monoiodobehenate of Calcium.—Sajodin, $(C_{21}H_{42}ICOO)_2Ca=C_{44}H_{84}O_4I_2Ca$, is the calcium salt of monoiodobehenic acid.

It is prepared from erucic acid, $C_{22}H_{42}O_2$, by addition of hydrogen iodide, forming monoiodobehenic acid, $C_{22}H_{43}O_2I$. This is converted into the calcium salt.

Sajodin is a colorless, odorless and tasteless powder, insoluble in water. On heating it generates an abundance of iodine vapor; on exposure to light the superficial portion becomes yellow without material decomposition.

It should contain 26 per cent. of iodine and 4.1 per cent. of calcium.

Actions and Uses.—Although containing a smaller quantity of iodine than potassium iodide, sajodin is claimed to be equally efficient. It is said to have been proven exceptionally free from the unpleasant and deleterious by-effects of the iodides.

It is used for the same purposes as potassium iodide.

Dosage.—1 to 3 Gm. (15 to 45 grains) daily.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany, and Farbwerke vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 848,230 (March 26, 1907; expires 1924). Trademark pending.

Sajodin Tablets, 8 grains. Each tablet contains sajodin 0.52 Gm. (8 grains).

SALOPHEN — Acetylparamidophenol Salicylate.—Acetparamidosalol. — Salophen is 1,4-acetamino-phenyl salicylate, $(C_6H_4.OH.COO).C_6H_4NH.(CH.CO)$, the salicylic acid ester of 1,4-acetaminophenol, $C_6H_4(NHCH_3CO)(OH)$.

It is made by preparing paranitrophenol salicylate by a process similar to that of preparing phenyl salicylate (salol); converting this by means of reducing agents into paramidophenol salicylate, and this into acetylparamidophenol salicylate by the action of acetic acid. This crude salophen so obtained is then purified by crystallization from benzene or alcohol.

It forms small, white, crystalline leaflets or powder, odorless and tasteless, melting at 187° to 188° C. (368.6° to 370.4° F.), and containing 51 per cent. of salicylic acid. It is almost insoluble in cold water, more soluble in warm water, but freely soluble in watery solutions of the alkalies and in alcohol, ether and benzene, but not in petroleum benzin.

If its alkaline solution be boiled it gradually becomes blue; on continuing the boiling the color is discharged, but is again produced on cooling and exposure to air. On addition of ferric chloride to the alkaline solution the violet color characteristic of salicylic acid is produced, but a simple aqueous solution of salophen does not react with ferric chloride and should not be changed by silver nitrate. It forms a colorless solution with concentrated sulphuric acid.

It is incompatible with alkalies, which decompose it.

Actions and Uses.—The actions of salophen resemble those of phenyl salicylate (salol). It is not changed in the stomach, but is broken up in the intestine, liberating salicylic acid and acetylparamidophenol, which, unlike phenol, is not toxic. It acts as an antirheumatic, antipyretic, antiseptic and analgesic. It is said to be useful in rheumatism, gout, typhoid fever, and as an intestinal antiseptic, in diarrhea and dysentery. Externally it has been applied in psoriasis and other itching skin diseases.

Dosage.—0.3 to 1 Gm. (5 to 15 grains), in powder, wafers or capsules. Externally in 10 per cent. ointment.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 492,868 (expired). U. S. trademark 20,759.

SANGUINARINE NITRATE — Sanguinarinæ Nitras.—Sanguinarine nitrate is the nitrate $(C_{20}H_{15}NO_4.HNO_3)$ of the alkaloid sanguinarine, obtained from sanguinaria canadensis and other plants.

Sanguinarine nitrate occurs in orange-yellow crystalline needles or deep-orange colored powder. It is soluble in water and in alcohol.

Action and Uses.—**Sanguinarine is a violent poison producing in mammals vomiting, purging, convulsions with loss of reflex activity and cardiac depression. The blood pressure is said to be raised by small doses.**

The principal use of sanguinarine nitrate is as a stimulant expectorant in chronic bronchitis and in the later stages of acute bronchitis. It is said to be an emmenagogue and may be used in functional amenorrhea.

Dosage.—**0.004 to 0.06 Gm. (1/16 to 1 grain); as an expectorant 0.004 to 0.008 Gm. (1/16 to ⅛ grain); as an emetic 0.015 to 0.06 gm (¼ to 1 grain); average dose 0.015 Gm. (¼ grain) to be given with caution.**

SANTYL—**Santalolis Salicylas.**—Salicylic Ester of Santalol.—Santyl is santalyl salicylate, $C_6H_4OH.COO(C_{15}H_{23}) = C_{22}H_{26}O_3$, the salicylic acid ester of santalol.

According to the German patent the neutral esters of sandalwood oil are produced by heating the oil with the respective acid anhydrides and subsequent purification of the product.

Santyl is a yellowish oil with only a faint balsamic odor and taste; specific gravity, 1.07 at 15° C. (59° F.); it boils under 20 mm. pressure at 121° C. (250° F.) to 126.6° C. (260° F.) with partial decomposition; insoluble in water, but soluble in about 10 parts of alcohol.

It is incompatible with alkalies and with the usual incompatibles of sandalwood oil and of salicylates.

Santyl should possess the physical constants given above. On saponification with alcoholic sodium hydroxide it should yield approximately 40 per cent. of salicylic acid and 60 per cent. of santalol.

Actions and Uses.—It is said that santyl passes the stomach unchanged, but is slowly split up in the intestines into its constituents, santalol and salicylic acid. Santyl is claimed to have the same actions as sandalwood oil, except that because of the slow liberation of santalol, it produces no irritation of the gastrointestinal tract nor of the kidneys and urinary passages, nor any unpleasant odor or eructations.

It is claimed to be useful like santal oil for gonorrheal urethritis.

Dosage.—1.5 Cc. (24 minims) usually given in three capsules of 0.5 Cc. (8 minims) each, three times a day.

Manufactured by Knoll & Co., Ludwigshafen, a. R., Germany (Knoll & Co., New York). German patent No. 173,240. U. S. patent No. 862,858 (Aug. 6, 1907; expires 1924). U. S. trademark No. 61,255.

SECACORNIN.—Ergotin Roche.—Secacornin is a solution of the active principles of ergot in a menstruum consisting of distilled water, glycerin and 7.5 per cent. of alcohol. 1 Cc. of secacornin corresponds to 4 Gm. of ergot U. S. P. and is said to be standardized according to the method of Kehrer (Arch. f. exp. Path. u. Pharm., vol. lviii).

Secacornin is prepared from ergot by removing fat by means of benzin or similar solvent and exhausting by percolation with diluted alcohol. The total percolate is then deprived of its alcohol by distillation in vacuo. The resinous mass which separates after cooling is then carefully drained off and the clear filtrate having been evaporated to the consistency of an extract is mixed with the general vehicle.

Secacornin is a dark brown solution, said to be sterile. It is claimed that it does not deteriorate on keeping.

Secacornin responds to the following identity test: 1.6 Cc. secacornin is mixed with 3.0 Cc. distilled water, and 5 drops of 10 per cent. ammonia water, and shaken out in a separatory funnel with 20.0 Cc. of ether. After complete separation of the two liquids, the aqueous solution is allowed to flow off, the remaining ether washed with 2.0 Cc. distilled water, and the wash-water likewise carefully separated. After this the ethereal solution is filtered into an Erlenmeyer flask, and traces of water removed by the use of as much anhydrous sodium sulphate as can be held on the point of a knife. Following this it is filtered into a small glass dish and cautiously evaporated.

The residue is then dissolved in from 1 to 1½ Cc. ferric-chloride-acetic acid (1 drop of Liq. ferri chloridi with 200 Cc. acetic acid). To this solution is added with a pipette, cautiously and without mixing, in order to form an understratum, 3.0 Cc. pure concentrated sulphuric acid. At the point of contact of the two liquids a characteristic blue to violet ring forms after a time.

Action and Uses.—The same as ergot.

Dosage.—0.5 Cc. (8 minims) are equivalent to 2 Cc. (30 minims) of fluid extract of ergot U. S. P. It may be given by intramuscular injection in doses of 0.5 to 1 Cc. (8 to 15 minims).

Manufactured by F. Hoffmann-LaRoche & Co., Basel, Switzerland (The Hoffmann-LaRoche Chemical Works, New York). Not patented. U. S. trademark No. 58,830.

SERUMS AND VACCINES

The vaccines, viruses and serums constitute one of the most important groups of drugs with which the physician has to deal. Some preparations of this group are specific cures for certain diseases; others are invaluable in prophylaxis and diagnosis. The great importance of exercising some degree of governmental control over these products was recognized by the passage by Congress in 1902, of a law entitled "An Act to Regulate the Sale of Viruses, Serums, Toxins and Analogous Products in the District of Columbia, to Regulate Interstate Traffic in Said Articles, and for Other Purposes." The law provides for the licensing of manufacturers who make these products. In order to obtain such a license it is necessary for an establishment desiring it to request the Surgeon-General of the U. S. Public Health and Marine-Hospital Service to have an inspection made of its laboratories, methods, products, etc. This inspection is made by an officer of that service, and consists in a careful examination of the stables, laboratory facilities, methods, animals, collection of the serum, standardization, and tests for potency, purity and amount of preservation. Samples of the products from licensed manufacturers are bought on the open market and examined at frequent intervals in the Hygienic Laboratory of the Public Health and Marine-Hospital Service. The inspection of the laboratories is repeated at least once a year and if unsanitary conditions are found, or if the products are not what they are claimed, the license is suspended.

Antidiphtheric and antitetanic serums are required to conform strictly to the standards which have been established by the United States Government. There being no established standard for the various other products they are not examined for their therapeutic value in the laboratory, but are tested for the amount of preservative and freedom from bacterial and toxic contaminations. Vaccine virus is examined particularly for its freedom from pathogenic bacteria, especially tetanus, and also for its potency.

The following pages contain a description of the preparations which may be legally sold in interstate commerce in the United States and which have not been found to conflict with the rules of the Council:

SERUMS AND VIRUSES

SERUM ANTIDIPHTHERICUM AND ANTIDIPHTHERIC GLOBULINS.—Antidiphtheric Serum or Diphtheria Antitoxin is an official preparation; for description see the U. S. Pharmacopeia, 8th decennial revision. The diphtheria antitoxin sold in interstate commerce in the United States and in the District of Columbia is required to conform to the standard established by the United States Public Health and Marine-Hospital Service. Some manufacturers mix serums of different strengths so as to secure a preparation containing approximately a definite number of units per c.c. Most of the firms also market a concentrated diphtheria antitoxin or antidiphtheric globulins prepared by the removal, by precipitation with neutral salts, of most of the constituents of the serum except that fraction of the globulins bearing antitoxic potency.

Inasmuch as the ordinary (not concentrated) serum antidiphtheric is contained in the U. S. P., it is desirable that the term "U. S. P." be used in connection with this product (and only with this one) in order to avoid confusion with the globulin preparations.

The French, German and Spanish Pharmacopeias recognize both liquid and desiccated preparations.

H. M. Alexander & Co., Marietta, Pa.

Diphtheria Antitoxin. **Only the antidiphtheric globulin is marketed; the antidiphtheric serum is concentrated and refined in accordance with recent improvements of the Gibson method. Marketed in syringes containing from 500 to 5,000 units.**

Burroughs, Wellcome & Co., London, England, and New York City.

Diphtheria Antitoxin Serum. **Serums of different values from a number of horses are mixed to yield a definite value (from 450 to 500 units per Cc.), also a high potency serum, 1 Cc. of which contains 1,000 units. Trikresol (0.3 per cent.) is added as a preservative. Marketed in hermetically-sealed vials containing 1,000 to 4,000 (Ehrlich-Behring) units; also a high potency serum containing from 1,000 to 10,000 units.**

Cutter Laboratory, Berkeley, Cal.

Diphtheria Antitoxin. Marketed in syringes containing 4,000 units; also in bulbs. Diphtheria antitoxin globulin marketed in syringes containing 1,000 units.

Farbwerke, vorm. Meister, Lucius and Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York.)

Diphtheria Antitoxin "Behring;" imported into the United States only upon special order.

Department of Health, City of New York.

Refined and Concentrated Diphtheria Antitoxin (Globulin). The preparation is a solution of the globulins of the blood which are soluble in a saturated sodium chloride solution; this contains most of the antitoxin. Preserved with chloroform. Marketed in syringes containing from 2,000 to 5,000 units, each Cc. containing 800 to 1,500 units. Also in bulk.

Wm. R. Hubbert, Detroit, Mich.

Diphtheric Antitoxin. Marketed only in bulk (usually from 1 to 10 liters).

Lederle Antitoxin Laboratories, New York City. (Schieffelin & Co., New York.)

Diphtheria Antitoxin. Only antidiphtheric globulin is sold; this is marketed in syringes containing from 500 to 10,000 units each; also in vials containing from 1,000 to 5,000 units each. The latter are prepared more particularly for the use of Boards of Health.

Memorial Institute for Infectious Diseases, Chicago.

Antidiphtheritic Serum. Most of the antitoxin prepared is concentrated. Marketed in packages of from 1,000 to 5,000 units each, both in syringes ready for use and in bottles.

H. K. Mulford Co., Philadelphia.

Diphtheria Antitoxin, Concentrated (globulin). Prepared from serum antidiphthericum by the removal, by precipitation at 33⅓ per cent. saturation with ammonium sulphate, of the serum albumins and globulins. The product consists essentially of a soluble serum globulin freed from inorganic salts by dialysis and redissolved in physiological salt solution. Preserved with not more than ¼ per cent. trikresol or not more than 1/10 to 1 per cent. chloroform. Marketed in syringes containing from 1,000 to 5,000 units.

National Vaccine and Antitoxin Institute, Washington, D. C.

Diphtheria Antitoxin, Concentrated; prepared according to Gibson's method. Preserved with chloroform. Marketed in syringes containing from 500 to 6,000 units.

Parke, Davis & Co., Detroit, Mich.

Antidiphtheric Serum, U. S. P.; preserved with 0.4 per cent. trikresol; marketed in piston syringe containers of from 500 to 5,000 units each.

Antidiphtheric Globulins. Marketed as above.

Antidiphtheric Globulins (dry). Marketed in packages of 3,000 units each. The dry powder is readily soluble in water and will keep indefinitely.

Frederick Stearns & Co., Detroit, Mich.

Diphtheric Antitoxin, U. S. P. Preserved with 0.4 per cent. trikresol. Marketed in syringe containers holding from 1,000 to 4,000 units.

Concentrated Diphtheric Antitoxin. Prepared by the Gibson process; preserved with chloroform (2.4 minims per fluid ounce). Marketed as above; also in syringes containing 5,000 units.

ANTIDYSENTERIC SERUM.—

H. K. Mulford Co., Philadelphia, Pa.

Antidysenteric Serum. The blood serum of horses immunized against the Shiga bacillus. Recommended in dysentery and summer diarrheas where the bacillus of Shiga is an etiologic factor. Marketed in syringes containing 10 Cc. Dose 10 to 40 Cc. every four to eight hours; to be injected hypodermically.

ANTIGONOCOCCIC SERUM.—

Favorable results have been reported from the use of antigonococcic serum in the treatment of chronic complications of gonorrhea involving serous cavities, especially the joints. The results in the case of the chronic stages and sequels of gonorrhea involving the genito-urinary tract seem to be less favorable while it seems to have still less value in acute gonorrheal affections.

Parke, Davis & Co., Detroit, Mich.

Antigonococcic Serum, prepared from the blood of rams immunized against both dead and living cultures of virulent gonococci according to the method of Rogers and Torrey[1]. Marketed in bulbs

Dosage. Two Cc. subcutaneously, to be repeated in 1 to 4 days.

ANTIMENINGOCOCCUS SERUM.—

Farbwerke, vorm. Meister, Lucius und Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York.

Meningococcus Serum "Hoechst." A serum prepared by the immunization of horses with virulent cultures of diplococcus intracellularis or its products according to Ruppel's method. Recommended as a diagnostic agent for distinguishing (by the agglutination test) the meningococcus from other diplococci and as a prophylactic and curative agent. It is injected subcutaneously or intraiumbarly or in the dry form may be used as a dusting powder applied to the nasopharyngeal space or tonsils. Marketed in powder form mixed with 49.5 per cent. milk sugar and 0.5 per cent. alumnol, for use as a dusting powder; also in the dried form to be dissolved in 10 parts of water and injected subcutaneously or intralumbarly; also in the liquid form, preserved with 0.5 per cent. phenol (for agglutination tests).

Dose. 2.5 Gm. of the dried serum, dissolved in 25 Cc. water, subcutaneously to be followed, after lumbar puncture, by 10 to 15 Cc. or more, intralumbarly. In severe cases much larger amounts are recommended. 1 Gm. as a protective dose.

H. K. Mulford Co., Philadelphia.

Antimeningitis Serum. A serum prepared from the blood of horses immunized to the meningococcus of Weichselbaum (Diplococcus intracellularis), according to the method of Flexner (inoculation of autolyzed cultures followed by living organisms).

It is useful for the treatment of epidemic cerebrospinal meningitis, due to the meningococcus.

Dose. 15 to 30 Cc. (4 to 8 fluidrams) given by intraspinal injection. For young infants, 10 Cc. (2½ fluidrams). The serum is marketed in aseptic glass syringes with sterilized needle.

ANTIPNEUMOCOCCUS SERUM.—

Antipneumococcus serum is the blood serum of horses immunized against pneumococci. Frequently both dead and living pneumococci are used.

Use.—It has been said to be useful in the treatment of pneumonia when injected subcutaneously. Hektoen, Weaver and Tunnicliff have recently examined the serums of this class found on the American market. They summarize their views as follows: "In the antipneumococcus serums it was impossible to demonstrate antibodies for pneumococci by any method employed."

"It is our belief that the claims for the usefulness of antistreptococcus and antipneumococcus serums rest on impressions from results in clinical cases in man, and have in most cases no foundation whatsoever in experimental tests."

H. K. Mulford Co., Philadelphia.

Antipneumococcic Serum, stated to be prepared by immunizing horses with both dead and living pneumococci. Marketed in syringes containing 20 Cc. Dose: 20 to 100 Cc.

Frederick Stearns & Co., Detroit, Mich.

Pneumolytic Serum, stated to be a composite polyvalent serum prepared by injecting horses with virulent pneumococci from various sources. The horses are first immunized with diphtheria toxin. Marketed in syringes containing 20 Cc. Dose: 10 to 20 Cc., to be repeated in 12 to 24 hours.

ANTISTAPHYLOCOCCUS SERUM.—

Burroughs, Wellcome & Co., London, England, and New York.

Antistaphylococcus Serum is stated to be obtained from horses injected with killed cultures of staphylococcus pyogenes aureus, albus and citreus. Preserved with trikresol. Marketed in vials containing 25 to 50 Cc. Recommended in the treatment of various staphylococcus infections.

ANTISTREPTOCOCCUS SERUM.—

Antistreptococcus serums are prepared by immunizing horses with virulent cultures of streptococci. Most manufacturers employ several strains of streptococci, thus obtaining polyvalent serums. In some cases humanized strains of streptococci are used; in others, cultures, the virulence of which has been much increased by passage through animals. In a few cases both human and animal strains are employed. Some manufacturers employ horses immunized against diphtheria, making the doubtful claim that such serum is especially active in stimulating leucocytosis and phagocytosis.

Actions and Uses.—Antistreptococcus serum has been claimed to be useful in the treatment of streptococcus infections such as erysipelas, scarlet fever, puerperal septicemia, tuberculosis (mixed infection), etc. It has also been used as a prophylactic prior to surgical operations, after labor, in scarlet fever epidemics, etc. Its value is doubtful.

Hektoen, Weaver and Tunnicliff recently examined the preparations found on the American market; in a preliminary report (1) they state: "Streptococcus opsonins could not be demonstrated in any of the serums tested, and activation by fresh serums was not accomplished to any significant degree. When they were injected into rabbits, increase in streptococcus opsonins could not be demonstrated in the animals' serums in any notable degree, except in some instances. Attempts to obtain protective and curative effects from the injection of antistreptococcus serums in rabbits, guinea pigs, and in a more

1. THE JOURNAL A. M. A., Sept. 14, 1907, xlix, 918.

containing 2 Cc. each.

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limited scale in mice, met failure. The serums often seemed to reduce the natural resistance and to hasten death."

"It is our belief that the claims for the usefulness of antistreptococcus and antipneumococcus serums rest on impressions from results in clinical cases in man, and have in most cases no foundation whatsoever in experimental tests."

Antistreptococcus serum (liquid and desiccated) is recognized by the French pharmacopeia.

Burroughs, Wellcome & Co., London, England, and New York.

Polyvalent Antistreptococcus Serum is stated to be obtained from horses injected with killed cultures of a number of strains of cases of erysipelas, scarlet fever, puerperal fever, rheumatism, septicemia, angina, pneumonia and ulcerative endocarditis.

Antistreptococcus Serum (Erysipelas) is stated to be obtained from horses injected with killed cultures of a number of strains of streptococci obtained from cases of erysipelas.

Antistreptococcus Serum (Rheumatism) obtained from horses injected with killed cultures of a number of strains of streptococci obtained from cases of rheumatism.

Antistreptococcus Serum (Scarlatina) obtained from horses injected with killed cultures of a number of strains of streptococci obtained from cases of scarlet fever.

Antistreptococcus Serum (Puerperal Fever) obtained from horses injected with killed cultures of a number of strains of streptococci obtained from cases of puerperal fever.

All of the above are prepared with trikresol and are marketed in hermetically-sealed vials containing in most cases 25 to 50 Cc.

Cutter Laboratory, Berkeley, Cal.

Polyvalent Streptococcic Serum, stated to be prepared by the injection of many strains of living humanized cultures of streptococci into horses immunized with diphtheria toxin. Marketed in piston syringe containers, each containing 10 Cc. of serum.

Chemische Fabrik auf Actien (vorm. E. Schering), Berlin, Germany. (Schering & Glatz, New York.)

Aronson's Antistreptococcus Serum, stated to be a polyvalent serum obtained by inoculating horses with streptococci the virulence of which has been highly exalted by animal passage and with various humanized strains of streptococci. Preserved with 0.4 per cent. trikresol. Dose: 20 to 100 Cc., according to the severity of the case and the age of the patient.

Farbwerke, vorm. Meister, Lucius and Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York.

Antistreptococcic Serum, Hoechst, stated to be a polyvalent serum, prepared by immunizing horses against streptococcus cultures of the most varied origin and with highly virulent passage cultures according to the method of Meyer and Ruppel. Contains no artificial preservatives. Dosage: 1 to 10 Cc. for immunization. 2 to 25 Cc. for single curative dose. 3 to 50 Cc. for double curative dose.

Lederle Antitoxin Laboratories, New York City. (Schieffelin & Co., New York.)

Antistreptococcic Serum Polyvalent; marketed in 10 Cc. syringes. Dose: as a prophylactic, 10 Cc.; curative, 20 to 100 Cc.

H. K. Mulford Co., Philadelphia.

Antistreptococcic Serum, stated to be the serum of horses which have been treated with streptococci of various strains. Marketed in 10 Cc. syringes. Dose: 20 to 80 Cc.

Parke, Davis & Co., Detroit, Mich.

Antistreptococcic Serum, stated to be a polyvalent serum; prepared by immunizing horses with killed cultures of streptococci; the latter are obtained from various human streptococcus infections and certain pathologic conditions common to animals. Preserved with trikresol. Marketed in 10 Cc. piston syringe containers, also in bulbs containing 10 Cc. each.

Frederick Stearns & Co., Detroit, Mich.

Streptolytic Serum, stated to be a composite and polyvalent serum; composite because it contains diphtheric antitoxin in addition to the streptococcus antibodies. Marketed in 10 Cc. syringes some of which have attachments for subcutaneous injection, others for rectal injection.

ANTITUBERCLE SERUM.—

Parke, Davis & Co., Detroit, Mich.

Antituberele Serum. A serum prepared by treating horses for several months with the toxic products of the tubercle germs. Stated to be an experimental remedy claimed by some to give favorable results in tuberculosis. Marketed in 1, 2 and 4 Cc. bulbs and in 1 ounce bottles. Dosage: 1 to 4 Cc. daily hypodermically.

ANTITYPHOID SERUM.—Antityphoid serum is a serum obtained from horses which have been injected with killed cultures of bacillus typhosus.

Actions and Uses.—Antityphoid serum has been employed in the treatment of typhoid fever, but the evidence as to its value is conflicting.

Burroughs, Wellcome & Co., London, England, and New York.

Anti-typhoid Serum is stated to be obtained from horses injected with killed cultures of Bacillus typhosus. Marketed in hermetically-sealed vials containing 25 to 50 Cc.

TETANUS ANTITOXIN.—(Antitetanic Serum and Antitetanic Globulin).—Antitetanic Serum is the blood serum of horses immunized to the toxin of the tetanus bacillus. It is marketed in both liquid and dry forms. Some manufacturers prepare an Antitetanic Globulin; this contains a solution of the globulins of the blood, which are soluble in a saturated sodium chloride solution, together with the antitoxin, and contains the latter in concentrated form.

The antitetanic serum sold in interstate commerce in the United States should conform to the standard established by the United States Public Health and Marine-Hospital Service. This standard is defined as follows (Treasury Department Circular No. 61, Oct. 25, 1907; Bulletin 43, Hygienic Laboratory): "The immunity unit for measuring the strength of tetanus antitoxin shall be ten times the least quantity of antitetanic serum necessary to save the life of a 350-gram guinea pig for ninety-six hours against the official test dose of a standard toxin furnished by the Hygienic Laboratory of the Public Health and Marine-Hospital Service."

Uses.—Antitetanic serum is used both as a prophylactic and a curative agent in tetanus. The dried product may be used as a dusting powder.

Dose.—Immunizing, 1,500 units; in tetanus, 3,000 to 20,000 units every four to eight hours.

Serum Antitetanicum is official in the Belgian, French and Swiss Pharmacopeias. Both liquid and desiccated preparations are recognized by the French Pharmacopeia.

Department of Health, City of New York.

Antitetanic Globulin. Preserved with chloroform. Marketed in vials containing 1,500 to 5,000 units.

Lederle Antitoxin Laboratories, New York City. (Schieffelin & Co., New York.)

Only the concentrated antitoxin (globulin) is marketed: this is offered in syringes containing from 1,500 to 5,000 units each.

H. K. Mulford Co., Philadelphia, Pa.

Tetanus Antitoxin, marketed in syringes containing 1,500 units.

Parke, Davis & Co., Detroit, Mich.

Antitetanic Serum, marketed as follows:

1. In piston containers, 1,500 units.
2. In bulbs containing 1,500 units.
3. Dry.
4. Antitetanic Dusting Powder; the dried serum mixed with a small quantity of chloretone (chlorbutanol).

VACCINE VIRUS.—Vaccine virus is the material obtained from the skin eruptions of calves having vaccinia. The "pulp" is ground and mixed with varying percentages of glycerin. The latter has a certain degree of antiseptic action. It is usually marketed in capillary tubes or as glycerinated points. The serums which exude after the removal of the crusts have been used by some manufacturers for the preparation of "dry lymph points." These are generally regarded as unsatisfactory and the new federal regulations forbid interstate traffic in them after Jan. 1, 1910.

Some firms test the activity of their products on the cornea of rabbits and on calves.

Vaccine virus is official in the Belgian Pharmacopeia under the name "Vaccinum"; in the Swiss as "Virus Vaccinum."

H. M. Alexander & Co., Marietta, Pa.

Marketed as "glycerinated lymph" in capillary tubes; also as "glycerinated vaccine points" and as "dry points."

Cutter Laboratory, Berkeley, Cal.

Marketed in two forms; ivory points (dry) and in capillary tubes.

Lederle Antitoxin Laboratories, New York City. (Schieffelin & Co., New York.)

Glycerinated Vaccine Virus: (a) in glass capillary tubes and in bulk (for 10, 20 or 50 vaccinations); (b) upon Lederle's Protected Ivory Points; the latter are contained in capsule-like glass tubes which do not require breaking.

H. K. Mulford Co., Philadelphia.

Glycerinated Vaccine Lymph, in sealed capillary tubes. Glycerinated Glass Vaccine Points; glycerinated lymph on sterile glass points.

National Vaccine and Antitoxin Institute, Washington, D. C.

Glycerinated Vaccine Virus marketed in capillary tubes; Glycerinated Vaccine Virus on Ivory Points; special capsule.

Parke, Davis & Co., Detroit, Mich.

Glycerinated Vaccine: (a) in capillary tubes, (b) on ivory points. The points are contained in sealed glass tubes provided with Lee's breakable ring so that they may be opened without difficulty.

BACTERIAL VACCINES

Bacterial vaccines (cf. also tuberculin) are suspensions of the killed bacteria in physiologic salt solution; phenol (0.5 per cent.) is usually added as a preservative. Being suspensions, there is a tendency for the bacteria to settle on standing; hence the vial should be shaken before the syringe is filled and the latter should be shaken before injecting.

Pharmacopeial Preparation.—The French Pharmacopeia contains a *"Vaccin antipesteux,"* consisting of a suspension of killed plague bacilli and a *"Vaccin antipesteux sensibilisé,"* prepared by treating killed plague bacilli with antiplague serum. (Antiplague Serum is also official in the French Pharmacopeia.)

Actions and Uses.—The use of many of these vaccines is in the experimental stage. Bacterial vaccines are often prepared from cultures obtained from the individual to be treated (autogenous vaccines); these usually give the best results. In fact some authors maintain that "stock" vaccines should be used only when it is impracticable to secure the autogenous agent.

Bacterial vaccines are used to aid the production of an active immunity. Great care and skill are necessary for their proper use and no definite statements as to dosage, etc., can be given; the physician must be guided by the condition of the patient and the manner in which the latter reacts to the treatment.

The following were licensed to manufacture and sell in interstate commerce products of this character prior to July 15, 1909. (Cf. also Tuberculin).

Burroughs Wellcome & Co., London, England and New York City.
Lederle Antitoxin Laboratories, New York City.
H. K. Mulford Co., Philadelphia, Pa.
National Vaccine and Antitoxin Institute, Washington, D. C.
Parke, Davis & Co., Detroit, Mich.
Swiss Serum and Vaccine Institute, Berne, Switzerland.

The following products have been submitted to the Council:

Some of the licensed firms do not market stock vaccines, but prepare them only from cultures from patients.

ACNE VACCINE—A vaccine prepared from acne bacilli (Bacillus acnes). Said to be useful in the milder forms of acne.

H. K. Mulford Co., Philadelphia.

Acne-Bacterin. This product is marketed in four syringes containing respectively 25 million, 50 million, 100 million and 200 million killed acne bacilli, sold in a package or as separate syringes.

Dose. Initially 5 to 25 millions.

BACILLUS COLI VACCINE.—Bacillus Coli Vaccine seems to cause distinct improvement in certain infections of the urinary tract, due to the colon bacillus. Pain and frequency of micturition are said to be quickly relieved, but complete elimination of the bacteria is stated to be rare. It has also been used in subacute and chronic appendicitis and in gall bladder fistulas where there was an infection with the colon bacillus.

H. K. Mulford Co., Philadelphia.

Coli-Bacterin. Marketed in 1 Cc. vials; each Cc. is said to contain approximately 50,000,000 killed bacilli suspended in normal salt solution.

BACILLUS PYOCYANEUS VACCINE.—This is said to be useful in local infections in which this organism is present. A recent writer states that he has never experienced the slightest beneficial effect either from the autogenous or stock vaccines prepared from this organism, and considers its use illogical.

H. K. Mulford Co., Philadelphia.

Pyocyano-Bacterin. Each Cc. is said to contain about 30,000,000 killed bacilli.

FRIEDLANDER VACCINE.—A vaccine prepared from the Friedlander bacillus. It is said to be useful in infections by the Friedlander bacillus, such as chronic nasal catarrh and chronic gleet.

H. K. Mulford Co., Philadelphia.

Friedlander Bacterin. This product is marketed in packages of four syringes, containing respectively 50 million, 100 million, 200 million and 400 million kl'led Friedlander bacilli. The single syringes may be obtained separately.

GONOCOCCUS VACCINE.—Gonococcus vaccine has been used with much success in subacute and chronic gonococcus infections involving the prostate, joints, eyes, etc. It has been stated that the strains of the gonococcus are not so diversified as are those of many other organisms and that therefore better results may be expected from stock vaccines of this organism than in many other cases.

Cutter Laboratory, Berkeley, Cal.

Gonococcic Vaccine. Marketed in 1 Cc. vials; each Cc. containing about 50,000,000 cocci suspended in physiological salt solution with 0.4 per cent. trikresol.

H. K. Mulford Co., Philadelphia.

Neisser Bacterin. Each Cc. is said to contain approximately 50,000,000 killed gonococci; preserved by 0.5 per cent. phenol.

National Vaccine and Antitoxin Institute, Washington, D. C.

Gonococcic Vaccine. Marketed in syringes each said to contain 2,000,000 to 50,000,000 bacteria; sterilized by heat.

Parke, Davis & Co., Detroit, Mich.

Gonococcus Vaccine. P., D. & Co. Marketed in bulbs each said to contain 20,000,000 bacteria; sterilized by heat.

MICROCOCCUS NEOFORMANS VACCINE.—Micrococcus neoformans vaccine is claimed to be beneficial in ulcerated tumors in which this organism occurs as a secondary infection.

H. K. Mulford Co., Philadelphia.

Neoformans-Bacterin. Each Cc. is said to contain approximately 50,000,000 killed neoformans micrococci.

PNEUMOCOCCUS VACCINE.—Pneumococcus vaccine has been claimed to be useful in pneumococcic infections. In laboratory experiments it was found inert so far as indicated by any change in the opsonic index when injected into rabbits.

H. K. Mulford Co., Philadelphia.

Pneumo-Bacterin. Each Cc. is said to contain about 50,000,000 killed pneumococci.

STAPHYLOCOCCUS VACCINES.—These have been used with much success in localized surface infections such as acne, acute boils, carbuncles and septic wounds, in multiple subcutaneous abscesses, sinuses, chronic osteomyelitis, etc. The best results are obtained with autogenous vaccines. Laboratory experiments have also shown that these vaccines possess distinct antigenic properties when tested by infections in rabbits with subsequent opsonin determinations.

Cutter Laboratory, Berkeley, Cal.

Staphylococcus Vaccine. Each Cc. contains about 500,000,000 cocci preserved with 0.4 per cent. trikresol.

H. K. Mulford Co., Philadelphia.

Four varieties of vaccine are offered:

1. *Staphylo-Albus Bacterin.* From staphylococcus pyogenes albus.
2. *Staphylo-Aureus Bacterin.* From Staphylococcus pyogenes aureus.
3. *Staphylo-Bacterin.* Containing a mixed culture of staphylococcus albus, aureus, and citreus.
4. *Staphylo-Acne-Bacterin.* A mixed vaccine prepared from cultures of staphylococcus albus, aureus, and citreus with bacillus acnes.

All the above are marketed in packages of four syringes containing respectively 250 million, 500 million, 1 billion and 2 billion killed staphylococci. The syringes of staphylo-acne bacterin contain in addition, respectively, 25 million, 50 million, 100 million and 200 million acne bacilli. The single syringes may be obtained separately.

Parke, Davis & Co., Detroit, Mich.

Four forms of vaccines are offered.
1. From staphylococcus pyogenes albus.
2. From staphylococcus pyogenes aureus.
3. From staphylococcus pyogenes citreus.
4. From the three preceding combined.
Each Cc. contains about 400,000,000 bacteria.

STREPTOCOCCUS VACCINE.—Recommended in various infections by streptococci (scarlet fever, puerperal septicemia, erysipelas, etc.).

H. K. Mulford Co., Philadelphia.

Strepto-bacterin. Each Cc. contains about 50,000,000 killed streptococci.

Parke, Davis & Co., Detroit, Mich.

Streptococcus Vaccine. Each Cc. contains about 40,000,000 streptococci pyogenes.

TYPHOID VACCINE.—Inoculations with typhoid vaccines have been practiced extensively in various armies; the results, both as regards the morbidity and the mortality from typhoid fever seem to have been distinctly favorable. Such inoculations have been recommended in institutions where many of the personnel are not infrequently exposed to typhoid infection and in communities threatened with or affected by typhoid epidemics. It has been suggested that typhoid vaccines may be of value in the treatment of typhoid carriers.

H. K. Mulford Co., Philadelphia.

Typho-bacterin. Each Cc. contains about 50,000,000 killed typhoid bacilli.

TUBERCULIN PREPARATIONS

Tuberculins represent the toxins of the tubercle bacillus. They may be in the form of a filtered extract of the bacilli or may be composed of the pulverized insoluble substance of the bacilli themselves. In the latter, or emulsified form, tuberculin is known as tubercle vaccine, and might be classed with the "Bacterial Vaccines" (which see). Tuberculins are therefore of two general classes:

1. Those prepared from the germ-free culture media, and containing for the most part only soluble products of the bacillus. This class includes Tuberculin "old" (or Tuberculin Koch) and Tuberculin Denys (Bouillon Filtré).

2. Those which contain the greater part of the germ body itself; they include the new tuberculins of Koch ("T. R." and the "New Tuberculin Koch [Bacillus emulsion]").

OLD TUBERCULIN, "O. T." (Tuberculin Originale, "T. O."; Tuberculin Koch).

Old Tuberculin is prepared by evaporating a 6 to 8 weeks' bouillon culture of tubercle bacilli at boiling temperature to 1/10 of its volume and filtration through clay or porcelain. A clear, syrupy, amber colored fluid; containing about 50 per cent. glycerin[1]. Frequently marketed in "serial dilutions" by which the doses may be gradually increased.

TUBERCULIN "DENYS" ("B. F."; Bouillon Filtrate; Bouillon Filtré, Denys).

This is the bouillon from cultures on which tubercle bacilli of the human type have grown to maturity (5 to 6 weeks) freed from germs by filtration through porcelain.

"NEW TUBERCULIN"—"T. R."—New Tuberculin represents a portion of the tubercle bacillus.

It is prepared as follows: A suspension of ground virulent tubercle bacilli is centrifugalized; the upper layer, consisting of extractives and fatty substances mixed with bacilli, is removed while other bacilli and fragments are thrown to the bottom. The sediment is again ground and centrifugalized; the process is repeated until almost no sediment remains. The second and supernatant liquids are united and to them glycerin, 20 per cent., and a little formaldehyde in solution are added; this emulsion is the "T. R." Each Cc. represents the residue from approximately 10 mg. dry originally virulent tubercle bacilli (human).

NEW TUBERCULIN, KOCH, BACILLI EMULSION ("B. E."). This represents the entire bacilli whether soluble or insoluble.

The germs are simply crushed and pulverized and mixed with equal parts of water and glycerin. The suspension contains 5 mg. dry, originally virulent, tubercle bacilli (human).

Action and Uses.—The different modifications and preparations of tuberculin are practically identical in their physiologic effects. They vary chiefly in a quantitative way and in absorbability. They are used both for diagnostic and therapeutic purposes:

Diagnostic Use.—"Tuberculin depends for its diagnostic value on a special sensitiveness acquired by the tissues after a tuberculous infection. This sensitiveness is manifested by an inflammatory response when tuberculin is brought in contact with the skin or mucous membrane."[1] The original tuberculin of Koch is considered the most satisfactory preparation for diagnosis but other filtered extracts are suitable. There are four principal methods of applying the test: 1. The Cutaneous Test (von Pirquet); 2. The Inunction Test (Moro); 3. The Conjunctival Test (Wolff-Eisner, Calmette); 4. The Subcutaneous Test. The proper performance and correct interpretation of these tests require much knowledge and experience. Some of them, notably the conjunctival and subcutaneous tests, may, under certain circumstances and in the hands of inexperienced or careless persons, do much harm.

Use in Therapeutics.—The successful employment of tuberculin in therapeutics depends upon a thorough knowledge of the disease and the individual patient; in many cases its use may do much harm. Baldwin[2] states the general principle involved as follows:

"The therapeutic use of tuberculin may have two fairly definite objects in view: One is to diminish the sensitiveness to the toxin—i. e., to itself—the other is to create intermittent local reactions and thus to stimulate the disease focus to heal or become absorbed. The possibility of the production of a recognizable immunity to the disease thus far by any form of tuberculin treatment is open to question. A certain degree of resistance is indirectly accomplished when sensitiveness to tuberculin is decreased to a marked degree, accompanied by constitutional improvement. Such specific resistance as can be obtained by tuberculin is gradually lost after the treatment is discontinued, so that statements that patients can be made 'immune' are unjustified."

As regards the choice of tuberculin and the method of administration Baldwin says:

"For therapeutic use the choice chiefly lies between the solutions and emulsions or vaccines. Opinions are too variant to permit the formulation of rules. In general the dosage is more controllable with solutions, and reactions are less frequent from emulsions." "Owing to the uncertain absorption of emulsions, reactions may ensue unexpectedly if the dose is increased greatly. The solutions are therefore safer for tuberculin immunization until some accurate standards for determining the dosage shall be made. The dosage is at present empirical; each individual case must be an experiment, and the symptoms carefully observed before each dose. The subcutaneous injection is the only satisfactory method for the administration of tuberculin. Tuberculin pills or capsules for stomach ingestion and suppositories per rectum are too uncertain of absorption to warrant any recommendation. Inunctions of tuberculin have a possible field in treatment of skin tuberculosis; otherwise they are also impracticable."

Pharmacopeial Preparations.—Koch's "old tuberculin" is official in the German Pharmacopeia under the name "Tuberkulinum-Kochi, Tuberkulin"; in the Belgian under the name "Tuberculinum"; in the Swiss under the name "Tuberkulinum Concentratum"; and in the French under the name "Tuberculine Brute." The French and Swiss Pharmacopeias contain also diluted tuberculin ("Tuberkulinum Normale Dilutum" of the Swiss, "Tuberculine Diluée" of the French, Pharmacopeia), prepared by diluting 1 Cc. of the concentrated tuberculin with 10 Cc. of 0.5 per cent. phenol. The French Pharmacopeia contains also a "Tuberculine Solide Purifiée" prepared by precipitating the "Tuberculine Brute" with ten times its volume of 80 per cent. alcohol, washing the precipitate with ether and drying *in vacuo*. For use 0.01 Gm. of this is dissolved in 100 Gm. distilled water.

TUBERCULOSIS SERUM VACCINE.—An emulsion of human tubercle bacilli, sensitized by the application of tuberculosis serum.

The production of sensitized tubercle bacilli, or bacilli which are capable of complement fixation, is accomplished with the assistance of an efficient tuberculosis-immune serum, which has a considerable content of specific amboceptor antituberculin. The content of this serum in specific amboceptor is ascertained according to the method of complement fixation. Besides antituberculin, this serum contains agglutinating, precipitating and bacteriotrope immune bodies.

Emulsions of sensitized tubercle bacilli are prepared as follows: Human tubercle bacilli, after having been thoroughly washed and briskly dried, are mixed with fresh tuberculosis serum, the quantity of which is calculated from the determination of the immunity bodies. This mixture is left for several days in the incubator, at a temperature of 37° C., and is then shaken in an apparatus, with glass beads, until intact tubercle bacilli are no longer demon-

1. Some firms add trikresol to their preparations of this tuberculin; the necessity or advisability of this is considered questionable if the glycerin is of the proper strength. It is stated that trikresol will, in the course of time, weaken the tuberculin.

1. Baldwin: THE JOURNAL A. M. A., 1910, llv, 260.
2. Baldwin: THE JOURNAL A. M. A., 1910, llv, 260.

strable in the removed sample. The broken-up masses of bacilli are then separated from the serum, through centrifugalization, washed with physiologic salt solution, and finally worked into fine emulsions, with 40 per cent. glycerin water, to which has been added phenol 0.5 per cent. The contents of this emulsion in bacillary substance amounts to 0.005 Gm. in 1 Cc. The original emulsions and dilutions are to all intents and purposes permanently durable, provided they are kept in a cool place, not exposed to freezing, and protected from the light.

Actions and Uses.—It is claimed that this emulsion contains specific immune bodies which are non-poisonous for healthy and tuberculous subjects, but are capable of exerting a remarkable effect on tuberculous processes.

Preparations[1]:

The use of ready made "serial dilutions" as a routine practice is not to be commended. Such solutions deteriorate rapidly, especially in the presence of phenol or trikresol and the rate of such deterioration may not be the same in different dilutions; competent authorities think it desirable to limit the use of dilutions to one month or even less in the case of soluble tuberculins. Some firms state the date of manufacture on the labels; it is desirable that this should be done in all cases. Sufficient precautions are often not given as to the care necessary in passing from a weak to a stronger solution.

The dangers from the use of tuberculin in the eye are not sufficiently emphasized by some firms.

The "conclusions" which some manufacturers state may be drawn from a "positive reaction" seem to the Council to be in some cases stated too dogmatically.

H. M. Alexander & Co., Marietta, Pa.

Original Tuberculin "O. T." (Koch); marketed in 1 and 3 Cc. vials.

Tuberculin.—Bouillon Filtrate "B. F." (Human). 1 and 3 Cc. vials.

Tuberculin Residue. T. R. (Human) (Koch).

Bacillin Emulsion "B. E." (Human).

Dixon's Tubercle Bacilli Extract (See "Fluid of Dixon," Medical News, Jan. 17, 1891). An extract of tubercle bacilli dissolved in normal saline solution. Marketed in syringes containing the extract from 1 mg. bacilli. The standard therapeutic dose is a weekly injection of the contents of 1 syringe, to be reduced in amount and frequency if the patient shows signs of reaction.

Dixon's Suspension of Dead Tubercle Bacilli (See "Possibility of Establishing Tolerance for Tubercle Bacilli," Medical News, Oct. 19, 1889). A suspension of dead tubercle bacilli in physiologic salt solution which have been decreased by prolonged treatment with alcohol and ether. Marketed in syringes containing 0.001 mg. bacilli, which is the standard therapeutic dose (cf. preceding).

Tuberculin for the Cutaneous Test (von Pirquet). A solution of *tuberculin original* in capillary tubes. Solutions of two strengths, one for children and one for adults, are prepared.

Tuberculin Ointment Capsules (for the Moro Test). Consists of equal parts by weight of Koch's Old Tuberculin and anhydrous wool fat. Marketed in capsules.

Tuberculin for the Ophthalmic Test. Tuberculin Precipitatum, "T. P." Prepared by precipitation with 95 per cent. alcohol from Koch's Old Tuberculin. Marketed in tubes in solutions of two strengths (0.5 per cent. and 1 per cent.).

Tuberculins for the Detre Differential Diagnostic Test. Three capillary tubes: 1. Tuberculin Original, "T. O." 2. Bouillon Filtrate, "B. F." (Human). 3. Bouillon Filtrate, "B. F." (Bovine).

Cutter Laboratory, Berkeley, Cal.

Tuberculin "Old," Koch; Concentrated; in 1 Cc. vials and preserved with trikresol; for use in solutions only. Also in serial dilutions; the latter in packages containing 5 bottles each holding about 8 Cc., ranging from 0.01 to 100 mg. per Cc.

Deny's Bouillon Filtrate; in 1 Cc. vials; preserved with trikresol; for use in dilutions only. Also in serial dilutions.

Tuberculin, Koch (concentrated).—For the *cutaneous reaction;* in capillary pipettes.

Tuberculin, Purified; 1 per cent. solution, for the ophthalmic reaction.

Farbwerke vorm. Meister, Lucius and Bruening, Hoechst a. M., Germany. (Victor Koechl & Co., New York.)

Tuberculin "Koch" (old). Marketed in vials containing 1 Cc., 5 Cc. or 50 Cc.

New Tuberculin "Koch" (T. R.). Marketed in vials containing 1 Cc. and 5 Cc.

Koch's Bacilli Emulsion. Marketed in vials containing 1 Cc. and 5 Cc.

Tuberculosis Diagnostic "Hoechst." Dried tuberculin free from glycerin, prepared from Tuberculin Koch (old Tuberculin). To be used in 0.1 per cent. solutions for the tuberculo-ophthalmic reaction.

Tuberculosis Diagnostic "Hoechst" Dry in Tubes. Each tube contains 0.005 Gm. (1/10 grain).

Dosage. The contents of a tube are dissolved in 5 Cc. of cold sterile water.

Tuberculosis Diagnostic "Hoechst" 0.1 per cent. solution.

Dosage. The contents of the tube are ready for use.

Tuberculin T. O. A. Original Tuberculin T. O. A. This preparation is a bouillon filtrate. For preparation see Tuberculin "Deny's," Supplied in bottles containing 1 Cc. and 5 Cc.

1. The directions given by some manufacturers as to the method of using and the conclusions to be drawn from the use of their preparations seem to the Council to be open to criticism in certain respects. Thus many firms enclose droppers for use in making dilutions; droppers are not sufficiently accurate for use with strong solutions. Pipettes, accurately calibrated in the metric system, should be used

Vacuum Tuberculin. Tuberculin T. O. A. reduced to 1/10 of its volume in a partial vacuum at a low temperature.

Actions and Uses. It is intended solely for the treatment of patients who exhibit too violent reactions to Old Tuberculin, to Tuberculin T. R. and to Tuberculin Bacilli Emulsion.

Vacuum Tuberculin is marketed in glass bottles containing 1 Cc. and 5 Cc.

Dry Dead Tubercle Germs. For use in making the bacillary emulsion for the tuberculo-opsonic test.

Bovine Tuberculin. Tuberculin corresponding to Tuberculin "Koch" Old but prepared from bovine bacilli. Marketed in bottles containing 1 Cc. or 5 Cc.

Bovine Bacilli Emulsion. Corresponding to Koch's Bacilli Emulsion but prepared from bovine bacilli. In original bottles containing 1 Cc. and 5 Cc.

Bovine Tuberculin T. R. Corresponding to Tuberculin T. R. but prepared from bovine bacilli. In bottles containing 1 Cc.

Bovine Tuberculin Old. A bouillon filtrate from bovine bacilli. Indications similar to those for Tuberculin T. O. A. Supplied in glass bottles containing 1 Cc. and 5 Cc.

Vacuum Bovine Tuberculin. A tuberculin prepared from bovine bacilli by the process for vacuum tuberculin. The advantage of the vacuum preparations is only in their better keeping qualities. Vacuum bovine tuberculin is supplied in glass bottles containing 1 Cc. and 5 Cc.

Polygenous Tubercle Bacilli Emulsion. A bacilli emulsion prepared from eight different cultures of tubercle bacilli which differ as much as possible from each other.

Dead Bovine Tubercle Bacilli. Supplied in flasks containing 1 Gm. and 5 Gm.

Tuberculin Residue. Tuberculin residue is supplied in the form of a moist paste and a dry preparation in vials of 1 Gm. and 5 Gm. each.

Tuberculosis Serum Vaccine "Hoechst." Emulsions of sensitized tubercle bacilli are supplied in the original concentration, in vials of 1 and 5 Cc. each, and also in serial dilutions.

Dosage. The treatment is begun with 0.1 Cc. of a dilution 1/1,000,000 and the dose gradually increased until 0.5 Cc. of the original emulsions are readily tolerated and the corresponding clinical effects are demonstrable. It should not be used in the presence of cachexia, mixed infection or permanent rise of temperature.

Tuberculin Gesellschaft, St. Petersburg, Russia. (Morgenstern & Co., New York.)

Endotin.—Tuberculinum Purum. Endotin is the purified extract of a filtered culture of human bacilli in 50 per cent. glycerin.

Endotin is prepared exactly as Koch's "Old" tuberculin, but is subsequently treated with alcohol, ether, chloroform and xylol in order to eliminate the albumoses present.

Tuberculinum purum is now supplied in a carton of 4 series which are intended to represent a course of tuberculin treatment. Each series consists of 7 ampuls.

H. K. Mulford Co., Philadelphia.

Tuberculin "Old" (O. T.). Marketed in 1 Cc. vials; also in serial dilutions in 5 vials of 8 Cc. each progressing by doses of 2 minims containing 0.001 mg. to 2 minims containing 10 mg.; in rectal suppositories containing from 1 to 500 mg. tuberculin in cacao butter.

Tuberculin, Bouillon Filtrate, Denys. Marketed in 1 Cc. vials; also in serial dilutions.

Tuberculin "B." Marketed both in concentrated form and in serial dilutions.

Bacillin Emulsion "B. F." Marketed in 1 Cc. vials; also in serial dilutions.

Tuberculin Ophthalmic Test Solution. Prepared from the precipitate obtained on treating Tuberculin "Old" with 70 per cent. alcohol; ½ and 1 per cent. solutions in physiological salt solutions are made of the dry precipitate.

Tuberculin Ophthalmic Test Tablets. The precipitate as prepared above; each tablet contains 1 mg. dried tuberculin; to be dissolved in 0.13 Cc. (2 minims) of water.

Tuberculin Ointment. An ointment consisting of 50 per cent. of tuberculin "Old" with an equal part of adeps lanae hydrosus.

Parke, Davis & Co., Detroit, Mich.:

Tuberculin, "Old" (Koch). Marketed in ½ Cc. bulbs.

Tuberculin B. E. (concentrated). Bacillus Emulsion, marketed in bulbs containing 1 mg. of dry tubercle solids per Cc.

Tuberculin B. F.; marketed in 1 Cc. bulbs; contains 0.4 per cent. trikresol.

Tuberculin T. R. Marketed in 1 Cc. bulbs in 2 strengths; one contains 0.001 mg. of tubercle solids per Cc., the other 1 mg. per Cc.

Tuberculin Discs for the Ophthalmic Reaction. Prepared by precipitating concentrated tuberculin with alcohol. Each disc contains 3.3 mg. tuberculin which when dissolved in 0.3 Cc. (5 minims) of water makes a 1 per cent. solution.

Moist Dead Tubercle Germs. For use in making the bacillary emulsion for the tuberculo-opsonic test.

Bacterio-Therapeutic Laboratory, Asheville, N. C.

This laboratory is licensed to manufacture all tuberculin preparations including Watery Extract of Tubercle Bacilli (von Ruck) and Tubercle Bacilli Emulsions (von Ruck); they are supplied only to physicians who make special applications for them.

OTHER SERUM PRODUCTS

ANTIRABIC VACCINE.—An emulsion of the cords of rabbits that have died as a result of the subdural injection of fixed rabies virus. The fixed virus is obtained by passage of rabies virus through a long series of rabbits until the

animals die after a uniform period of incubation; this period may vary according to the strain of virus. The cords are removed from the rabbits and, as a rule, dried over potassium hydroxide for a period of from 2 to 15 days.

Use.—Antirabic vaccine is used for the preventative treatment of rabies. Emulsions of the cords are prepared with broth or saline solution and injected subcutaneously. The "scheme of dosage" varies according to circumstances, but the general principle consists in daily injections, beginning with an emulsion of a cord dried for from 8 to 14 days and gradually increasing until a "2 day" cord is used.

H. M. Alexander & Co., Marietta, Pa.

Antirabic Vaccine. The fixed virus is of the strain employed by the Hygienic Laboratory, Washington, D. C. An emulsion of vaccine in glycerin sufficient for one dose, together with a syringe and needle, is contained in a vacuum tube by which a low temperature may be maintained for a period of 36 hours. A dose is sent each day by mail; the treatment requires 18 to 22 days.

ERYSIPELAS AND PRODIGIOSUS TOXINS (Coley).—Parke, Davis & Co., Detroit, Mich. A mixed culture of Streptococcus Erysipelatis and Bacillus Prodigiosus made according to the specifications of Dr. W. B. Coley. Marketed in 1 oz. bottles.

Action and Uses.—Loeb summarizes the results of the treatment of sarcoma with these toxins as follows: "It is therefore likely that the treatment of inoperable sarcoma with the toxins of streptococcus and Bacillus prodigiosus leads to a cure in approximately 4 to 9 per cent. of cases. And some results obtained so far suggest that this method of treatment may prove of value as a postoperative procedure in diminishing the number of recurrences, and that in a certain number of cases it might limit the necessity for amputation of the limb in cases of sarcoma of the long bones. As to its mode of action, nothing definite can be stated, but it is likely that the toxins themselves, as well as the local and general reactions they produce, frequently affect the life of the sarcoma cells unfavorably."

The toxins are injected in gradually increasing doses, at first in a part of the body removed from the tumor, and later, if possible, directly into the tumor itself.

NORMAL HORSE SERUM.—Injection of this has been recommended in various conditions where the coagulative power of the blood is deficient, as in hemophilia, severe anemias and purpura with hemorrhagic tendencies. Applied locally to bleeding surfaces it is said to act as a styptic and to have a favorable action on septic wounds. There is, however, an element of danger in the use of this or any other serum in certain conditions (Anaphylaxis), and while this is slight because of the rarity of dangerous effects it is sufficient to make the use of serums for purposes in which their value is extremely doubtful a questionable procedure.

National Vaccine and Antitoxin Institute, Washington, D. C.

Sterile Normal Horse Serum. **Marketed in syringes containing 10, 15 and 20 Cc.**

H. K. Mulford Co., Philadelphia.

Normal Serum (From the Horse). **Marketed in packages of two** syringes, each containing 10 Cc.

Noguchi Test for Syphilis

Noguchi test for syphilis is a modification of the method of Wassermann and involves the use of two standardized papers as follows:

Amboceptor Paper.—This is obtained by injecting washed human blood corpuscles (erythrocytes) into rabbits, at intervals of five to seven days, over a period of five or six weeks. Ten days are allowed to elapse after the last injection. The rabbits are then bled and the serum collected. Filter paper is now saturated with this serum and allowed to dry. The paper is cut in strips and set aside until wanted for use. In this form amboceptor will keep for a considerable length of time.

Amboceptor paper is standardized by measuring its specific activity. The measurement of specific activity consists of finding the amount of amboceptor necessary to cause hemolysis in 1 Cc. of suspended human red corpuscles, one drop of blood in 4 Cc. normal saline solution with 0.02 Cc. of fresh guinea-pig serum. Incubate this at a temperature of 37½ C. for one hour. The quantity of paper necessary to cause hemolysis under these conditions is known as 1 unit.

Antigen Paper.—Antigen is made by rubbing liver tissue with sand and extracting with alcohol. One Gm. of liver tissue is macerated in 10 Cc. of alcohol for one week at 37.5 C., shaking the container every day. It is filtered until clear and the filtrate evaporated. The resulting extract is dissolved in ether and this solution poured into a large quantity of acetone. The acetone precipitates certain lipoid substances, which are then collected and redissolved in ether-alcohol and constitute the antigen. Antigen papers are now prepared by saturating filter paper with this solution and allowing it to dry, after which it is cut into strips. The unit of standardization is the amount of antigen paper necessary to prevent hemolysis of human red corpuscles in the presence of syphilitic serum. The antigen paper must not of itself cause hemolysis.

H. K. Mulford Co., Philadelphia.

Noguchi Test Mulford. **Noguchi test Mulford consists of amboceptor paper and antigen paper in a package accompanied with full directions for use.**

Amboceptor Paper. **Amboceptor paper is marketed in a glass tube.**

Antigen Paper. **Antigen paper is marketed in tubes containing** acetone, because it is believed to prevent oxidation. When wanted for use, a strip of the paper is removed from the vial and the acetone allowed to evaporate.

SILVER CITRATE.—Silver citrate, $Ag_3C_6H_5O_7$, is the normal silver salt of citric acid.

Solution of citric acid is neutralized with sodium carbonate and a solution of silver nitrate added with constant stirring. The precipitate is allowed to subside, washed with water, and dried on porous plates. The entire operation must be conducted under protection from the light.

Silver citrate forms a white, odorless, heavy powder which is moderately sensitive to the light. It dissolves in 3,800 parts of water. On heating to redness a residue of metallic silver remains, weighing 63.16 per cent. of the original salt.

It should be carefully protected from the light.

Actions and Uses.—Silver-citrate is a non-irritating antiseptic.

It is said to be useful in the treatment of wounds, ulcers, gonorrhea and other affections of the mucous membranes.

Dosage.—It may be applied in substance to wounds. Solutions **of from 1 to 4,000 to 1 to 10,000 are recommended for injection into the body cavities, the urethra, etc.**

Proprietary Preparations:

ANTISEPTIC-Credé.—**A name applied to Silver Citrate, which see.**

Manufactured by Fabrik von Heyden, Radebeul, near Dresden, Germany (Schering & Glatz, New York).

SILVER LACTATE.—Silver lactate, $Ag.C_3H_5O_3 + H_2O$, is the normal silver salt of lactic acid.

It is prepared by dissolving freshly precipitated silver carbonate in a solution of lactic acid by the aid of heat and concentrating the solution until crystallization begins. The operation must be conducted in a darkened room.

Silver lactate forms colorless crystalline needles, turning brown on exposure to light; it dissolves in 15 parts of water. On heating it leaves a residue of metallic silver weighing 50.2 per cent. It is usually colored somewhat brown and gives with water a brownish or reddish solution. The salt must be protected from the light.

Actions and Uses.—The 1 to 300 to 1 to 500 aqueous solution is said to be equal in disinfecting power to a 1 to 1000 solution of mercuric chloride. It is irritating if applied in substance to wounds.

It is intended for all purposes for which a powerful antiseptic is desired.

Dosage.—1 to 100 to 1 to 2,000 solutions.

Proprietary Preparations:

SILVER LACTATE-Credé.—**A name applied to Silver Lactate, which see.**

Manufactured by Fabrik von Heyden, Radebeul, near Dresden, Germany (Schering & Glatz, New York).

SODIUM CACODYLATE—Sodii Cacodylas.—Sodium Dimethylarsenate.—Sodium cacodylate, $(CH_3)_2AsO.ONa + 3H_2O$, is the sodium salt of cacodylic acid (dimethyl arsenic acid), $(CH_3)_2AsO.OH$.

It is prepared by distilling arsenous oxide with potassium acetate, oxidizing the distillate, composed of cacodyl $AS_2(CH_3)_4$, and cacodyl oxide, $(As_2(CH_3)_4O$, with mercuric oxide, neutralizing the cacodylic acid with solution of sodium hydroxide and concentrating to crystallization.

It is a white powder, very soluble in water, forming needle-shaped crystals, hygroscopic, but otherwise of marked stability. The aqueous solution is alkaline toward litmus, but nearly neutral toward phenolphthalein.

On addition of silver nitrate T. S. to a solution of 1 Gm. of sodium cacodylate in 20 Cc. of water, a white precipitate is formed which is soluble in nitric acid and in ammonia water.

If to 1 Cc. of a 1 per cent. solution of sodium cacodylate 10 Cc. of hypophosphorous acid are added and put aside for 1 hour in a closed container, a disgusting odor of cacodyl (caution on account of extreme poisonous properties of the gas) is apparent (distinction from sodium monomethyl arsenate).

If calcium chloride T. S. solution be added to a solution of sodium cacodylate (1:20) no precipitate will be produced in the cold nor on warming (distinction from sodium monomethyl arsenate).

When warmed with ammonium molybdate T. S. a solution of sodium cacodylate (1:20) should not produce a yellow precipitate; nor should a yellow precipitate form when the 1:20 solution is treated with sodium thiosulphate T. S. or with hydrogen sulphide T. S.; nor should a white precipitate form when, after acidulating with hydrochloric acid, barium chloride T. S. is added to the 1:20 solution.

Estimation: A weighed quantity (approximately 1 Gm.) is dissolved in 25 Cc. of water, one drop of methyl orange T. S. added, and then normal hydrochloric acid V. S. added until a faint pink color appears; 1 Cc. normal hydrochloric acid V. S. = 0.2125 Gm. of sodium cacodylate. If to the finished titration phenolphthalein T. S. is added a volume of normal potassium hydroxide V. S. equal to the volume of normal acid used, should be required to produce a red color; $(CH_3)_2AsO.OH$ being a monobasic acid toward phenolphthalein.

Actions and Uses.—The action of sodium cacodylate is similar to other arsenic compounds, but it is said to be much less toxic than the ordinary preparations of arsenic and is also less apt to cause undesirable side effects. This superiority is due to the slow liberation of the arsenous acid in the body.

The cacodylate has been particularly recommended in obstinate psoriasis, pseudoleukemia, diabetes, anemia, chlorosis, tuberculosis, malarial cachexia, etc.

Dosage.—0.025 to 0.12 Gm. (½ to 2 grains) in pills, hypodermically or by enema.

SODIUM CINNAMATE—Sodii Cinnamas.—Sodium Phenylacrylate. Sodium cinnamate, $C_6H_5.CH:CH.COONa = NaC_9H_7O_2$, is the sodium salt of cinnamic acid (benzene-propenoic) acid, $C_6H_5CH:CH.COOH$.

Sodium cinnamate may be prepared by saturating a hot aqueous solution of sodium carbonate with cinnamic acid, evaporating and crystallizing. Cinnamic acid is obtained from balsam of tolu or may be produced synthetically by heating together benzaldehyde, sodium acetate, and acetic anhydride. By the latter method of preparation a purer product is produced which it is claimed is free from any by-effects of the acid from natural sources.

Sodium cinnamate is a white, crystalline powder, soluble in water, 1 part in 20, the solution being faintly alkaline. On boiling the alkalinity becomes stronger on account of the decomposition of the cinnamic acid forming sodium carbonate. Solution of sodium cinnamate (1 to 25) yields on the addition of ferric chloride a yellow precipitate. On adding it to potassium permanganate solution, the red color of the permanganate is destroyed and the odor of benzaldehyde developed. If a solution of sodium cinnamate is treated with dilute sulphuric acid, a precipitate of cinnamic acid appears, which after purification should melt at 133° C. (271.4° F.).

It is incompatible with acids and with oxidizing agents, e. g., potassium permanganate.

Actions and Uses.—Balsam of Peru, cinnamic acid and sodium cinnamate are recommended by Landerer for the treatment of phthisis, the drugs being injected intravenously under strict aseptic precautions. The effect is referred by him to an inflammatory reaction, localized about the tuberculous foci which leads to cicatrization. He records very favorable results in well-selected early cases, and other clinicians have also reported some successes, although the treatment fails very often. The synthetic cinnamate is preferred on account of its greater purity.

Dosage.—0.001 Gm. (1/60 grain), gradually increased to 0.02 Gm. (1/3 grain), in 1 to 5 per cent. solution, injected intravenously thrice weekly for long periods (3 to 18 months).

SODIUM LYGOSINATE—Sodii Lygosinas.—Lygosin Sodium. — Sodium lygosinate, $CO:(CH:CH.C_6H_3.ONa)_2 + 7H_2O = Na_2C_{17}H_{12}O_4 + 7H_2O$, is the sodium salt of dioxy-dibenzal acetone.

It is prepared by condensation of 2 molecules of salicylic aldehyde with 1 molecule of acetone and combining the product with sodium.

Sodium lygosinate occurs in glossy, greenish prisms, soluble in 16 parts of water at 18.4° C. (67.12° F.), or in about 9.5 parts at 37° C. (98.6° F.). It is soluble to the extent of 1 per cent. in cold alcohol, easily soluble in hot alcohol and in glycerin. Its aqueous solution has a ruby-red color and is alkaline in reaction.

On ignition, 1 Gm. of sodium lygosinate leaves a residue of sodium carbonate weighing 0.243 Gm. From the aqueous solution acids precipitate a thick yellow precipitate of diortho-cumarketone. The solution is fairly stable when kept in a cool place, protected from the air, and is not decomposed on boiling, but is decomposed by weak acids, even the carbonic acid of the air.

Actions and Uses.—The powder causes sneezing. Sodium lygosinate is said to possess a germicidal power similar to that of the silver salts, slightly weaker, but practically non-irritant.

It is claimed to be useful in gonorrhea, especially of the uterus.

Dosage.—Injections of a 3 to 8 per cent. solution daily or every second or third day.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany. (C. Bischoff & Co., New York.) German patent No. 110,521. U. S. trademark No. 40,177.

SODIUM OLEATE[1]—Sodii Oleas.—Sodium oleate, $NaC_{18}H_{33}O_2$, is the sodium salt of oleic acid.

Sodium oleate is obtained by neutralizing sodium hydroxide with oleic acid.

Sodium oleate is a white solid, which crystallizes from absolute but not from aqueous alcohol. When heated it melts and burns leaving a residue of sodium carbonate. It is soluble in about 10 parts of water, in about 20 parts of alcohol, and in about 100 parts of boiling ether. When dissolved in water it is partly decomposed (hydrolysed) into oleic acid and sodium hydroxide; hence its aqueous solution has an alkaline reaction to phenolphthalein; its solution in strong alcohol is neutral to this indicator. It is precipitated from its aqueous solution by saturation with sodium chloride.

Adds separate from its aqueous solution oleic acid, which collects at the surface of the liquid, in an oily layer. If a solution of 5 Gm. of sodium oleate, in 50 Cc. of water be mixed with 3 Cc. of tenth-normal oxalic acid solution, the subsequent addition of a few drops of phenolphthalein test solution should not produce a pink coloration.

An aqueous solution of sodium oleate (1 in 20) should remain unchanged in color upon the addition of ammonium sulphide test solution; and upon acidulating another portion of the solution with hydrochloric acid and filtering, the filtrate should remain unchanged in color when an equal volume of hydrogen sulphide test solution is added and the mixture is allowed to stand well stoppered in a warm place for half an hour (absence of metallic impurities).

Action and Uses.—Sodium oleate is antacid and mildly laxative. It is commonly added to laxative pills. It has been claimed without any definite evidence that it is especially useful in disease of the biliary tract.

Dosage.—0.12 to 1.3 Gm. (2 to 20 grains).

SODIUM PERBORATE—Sodii Perboras.

Sodium perborate, $NaBO_3.4H_2O$, is the sodium salt of perboric acid. It should contain not less than 9 per cent. of available oxygen.

Sodium perborate may be prepared by the action of an alkali peroxide and carbon dioxide on an alkali borate (U. S. Pat. No. 842,470) and by other methods.

Sodium perborate occurs as a white granular salt, odorless and soluble in water; the solution has a saline taste. It is decomposed by water into hydrogen peroxide and sodium metaborate, $NaBO_3 + H_2O = H_2O_2 + NaBO_2$ producing an alkaline solution. It is decomposed by catalyzers, ferments and animal tissues. Heated to 60° C. (140° F.) it evolves oxygen and when heated to a higher temperature it gradually loses all its available oxygen and water of crystallization.

On adding to 10 Cc. water in a test tube, one drop of potassium dichromate test solution then ten drops of dilute sulphuric acid and pouring a few Cc. of ether on top, the subsequent addition of a few drops of an aqueous solution of sodium perborate will cause a blue color to appear at the zone of contact of the two liquids. After shaking the ether layer will separate with a blue color.

If 0.20-0.03 Gm. sodium perborate accurately weighed be dissolved in 50 Cc. water and 10 Cc. dilute sulphuric acid added, to produce a permanent pink color, not less than 11.25 Cc. tenth normal permanganate solution should be required for each 0.1 Gm. of substance taken (indicating not less than 9 per cent. of available oxygen).

Action and Uses.—Sodium perborate is an antiseptic, deodorant and bactericide, and is used in wounds, purulent sores, varicose ulcers, etc. In general, it is used in place of hydrogen peroxide, over which it has the advantage of yielding an alkaline solution. It is applied as a dusting powder or in a 2 per cent. solution.

Non-proprietary Preparation:

Sodium Perborate Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

1. This preparation should not be confounded with the preparations sold as "Acid sodium oleate" or "Sodium Oleate, acid" which are mixtures of sodium oleate and free oleic acid, containing from about 5 to 30 per cent. of the latter.

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Proprietary Preparation:

PEROGEN BATH—Oxygen Bath Salts. Perogen.—Perogen bath is a preparation consisting of a catalyzer and sodium perborate capable of yielding 10 per cent. of oxygen, the two substances being wrapped separately.

The catalyzer is a light yellow odorless powder, and is made by a method which is the subject of a patent application now pending. The oxygen contents may be determined by any of the well-known methods.

Actions and Uses.—The catalyzer is a medicinally indifferent substance. When the two substances are mixed with water the catalyzer causes the liberation of the available oxygen of the sodium perborate. The oxygen bath thus obtained is said usually to reduce blood pressure and the pulse rate to a much greater extent than the ordinary bath. It is claimed to have marked tranquilizing and somnifacient effects. It is said to be useful in cardiac affections with high vascular tension and excitement, neuroses, insomnia, chronic nephritis, and skin diseases in which hydrogen dioxide is indicated.

Dosage.—One bath daily until 24 or 48 have been taken, with occasional intermissions.

Manufactured by Morgenstern & Co., New York. U. S. trademark 75,982. U. S. patent No. 969,073 (Aug. 30, 1910; expires 1927).

SODIUM PEROXIDE—Sodii Peroxidum.—Bioxydum natri (Pharm. Hispanola, edit. vii).

Sodium Peroxide is the sodium salt of hydrogen peroxide containing at least 75 per cent. Na_2O_2.

Sodium peroxide occurs in the form of a white, or yellowish, amorphous powder. It is soluble in water, with evolution of heat, and forms a solution of hydrogen peroxide, from which latter, oxygen is liberated by the heat of the reaction. It dissolves in cold dilute acids forming a solution of hydrogen peroxide. When heated sodium peroxide becomes darker, but on cooling resumes its original color. It does not react with alcohol, but it ignites ether on contact. A mixture with red phosphorus explodes under pressure or on being struck. It is an extremely powerful oxidizing agent.

Sodium peroxide should not respond to tests for sulphates, chlorides, phosphates, nitrogen and heavy metals.

Action and Uses.—Sodium peroxide is not used internally but has been used in acne, applied in the form of a paste prepared with liquid paraffin, or as a soap to remove comedones.

It has been suggested as an air purifier, based on the theory that the moisture of the air would liberate oxygen and the alkali simultaneously formed would absorb carbon dioxide.

Proprietary Preparation:

OXONE.—Oxone is a name applied to fused sodium peroxide containing a fractional percentage of a catalytic agent. It is said to yield its entire content of available oxygen in gaseous form, upon contact with water.

Manufactured by the Roessler & Hasslacher Chemical Co., New York. U. S. patent No. 788,256 (April 25, 1905; expires 1922). U. S. trademark No. 46,673.

SOLUTION OF FORMALDEHYDE

Solution of Formaldehyde is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physician's Manual of the Pharmacopeia and National Formulary.

FORMALIN.—A name applied to Liquor Formaldehydi, U. S. P.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. trademark No. 65,625.

SOPHOL.—Sophol is a compound of silver and methylennucleinic acid, the silver being in organic ("masked") form.

It is prepared by conversion of insoluble silver compounds of methylennucleinic acid into soluble silver compounds by treatment with neutral salts, such as chloride of sodium. Sophol is a yellowish powder, having a metallic taste and claimed to contain silver, equivalent to not less than 20 per cent. metallic silver. Sophol is readily soluble in water, the aqueous solution having a faint alkaline reaction; it does not give a precipitate on the addition of dilute solution of sodium hydroxide or of sodium chloride; it is insoluble in ether and alcohol.

If 0.3 Gm. sophol is heated in a test-tube decomposition occurs with the development of brownish-red pungent vapors. If the ash is treated with dilute nitric acid, the solution filtered, a white cheesy precipitate is formed on addition of hydrochloric acid, which dissolves in ammonia water.

If 0.5 Gm. sophol is boiled with 5 Cc. of sodium hydroxide solution, the latter assumes a black color with the development of a formaldehyde odor.

If 0.1 Gm. sophol is heated with 3 Cc. nitric acid, a dirty yellow precipitate is formed, disappearing on addition of an excess of ammonia water with the formation of an orange colored solution.

A solution of 0.5 Gm. sophol in 10 Cc. water should have a faintly alkaline reaction and should not at once become turbid on the addition of sodium chloride solution.

If 1.0 Gm. sophol is shaken with 10 Cc. of alcohol and filtered, the filtrate should not be changed on addition of hydrochloric acid.

Actions and Uses.—It is said to act as a germicide and to be free from irritating effects in the solutions ordinarily employed.

It is said to be especially useful for the prevention and treatment of ophthalmia neonatorum and may be employed in other eye affections and for the general indications of the silver salts.

Dosage.—Sophol may be applied in from 2 to 5 per cent. solutions.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 852,545 (May 7, 1907; expires 1924). U. S. trademark No. 62,900.

SPIROSAL.—Spirosal is monoglycol salicylate, $C_6H_4OH.CO.O.CH_2.CH_2.OH = C_9H_{10}O_4$, the salicylic acid ester of monoglycol.

It is prepared by the action of ethylenegiycol on salicylic acid.

Spirosal is an almost odorless and colorless oily fluid, with a boiling point of 169° to 170° C. (336.2° to 338° F.) at 12 mm. pressure. It is easily soluble in alcohol, ether, chloroform and benzol and soluble in about 110 parts of water and 8 parts of olive oil.

Tests. 0.5 Gm. spirosal is saponified with 5 Cc. soda lye by slight warming, the clear fluid diluted with water and acidified with dilute sulphuric acid; fine crystalline needles of salicylic acid are formed, which after being extracted with ether and the latter then evaporated, can be identified by the melting point and ferric chloride reaction. The saturated watery solution obtained by shaking 1 Cc. spirosal with 50 Cc. of water gives a filtrate, which becomes intensely violet on addition of ferric chloride, but should not be changed by barium nitrate or silver nitrate; 0.5 Gm. of spirosal when added to 2 Cc. of concentrated sulphuric acid should be given a light yellow and not a brownish color; 0.3 Gm., if incinerated on platinum foil, should not leave any weighable residue.

Actions and Uses.—Spirosal is said to be easily absorbed by the skin without causing irritation even when rubbed in thoroughly. It splits off salicylic acid in the tissues.

Spirosal is said to be useful for the external treatment of rheumatic affections.

Dosage.—It is used undiluted or mixed with 2 to 3 parts of alcohol or in a mixture with olive oil, 1 to 8, or in ointments with equal parts by weight of petrolatum or lard.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany. (Farbenfabriken of Elberfeld Co., New York.) U. S. patent No. 794,982 (July 18, 1905; expires 1922). U. S. trademark No. 62,856.

STOVAINE—Benzoyl-Ethyl-Dimethylaminopropanol Hydrochloride.—Stovaine is 2-benzoxy-2-methyl-1-dimethyl-amino butane hydrochloride, $CH_3.CH_2.C(C_6H_5COO)(CH_3)CH_2N(CH_3)_2.HCl = C_{15}H_{23}O_2NCl$. It is closely related to alypin (which see).

It is prepared by causing a reaction of benzoyl chloride on the *a*-dimethyl-amino-pentonal-*b*, which is itself the product of reaction of ethylmagnesium chloride on methylaminoacetone.

It crystallizes in small, brilliant scales, which melt at 175° C. (347° F.). It is extremely soluble in water and easily in methyl alcohol and acetic ether, but requires 5 parts of absolute alcohol for solution and is only slightly soluble in acetone. It is quite stable and its solutions may be sterilized at 115° C. (239° F.) without suffering decomposition.

The aqueous solution is slightly acid to litmus, neutral to methyl orange. It is precipitated by all the alkaloidal reagents and is decomposed even by very dilute alkalies.

It is incompatible with alkalies and all alkaloidal reagents.

Actions and Uses.—Stovaine acts as a local anesthetic. It has about the same power as cocaine, but dilates the blood vessels, whereas cocaine contracts them. It is only ⅓ to ½ as toxic as cocaine. Stovaine also is said to exert a tonic action on the heart.

It is used as a local anesthetic; while most reports are favorable, one case of gangrene has been reported following the use of a 10 per cent. solution.

Dosage.—Internally, 0.002 Gm. (1/30 grain) pill form. Locally it may be used in the eye in 4 per cent solution and applied to other mucous membranes, as in laryngology, in from 5 to 10 per cent. solution. For hypodermic injections for local anesthesia it can be used in 0.75 to 1 per cent. solution.

Manufactured by the Poulenc Frères Co., Paris, France (Parmele Pharmacal Co., New York). U. S. patent Nos. 829,262; 829,374 (Aug. 21, 1906; expires 1923); 828,846 (Aug. 14, 1906; expires 1923). U. S. trademark No. 59,228.

STROPHANTHIN THOMS.—Strophanthin Thoms is a crystalline glucoside ($C_{30}H_{46}O_{12} + 9H_2O$), obtained from Strophanthus gratus. It is identical with the ouabain obtained from Ouabaio wood by Arnaud (the official strophanthin is methyl-ouabain ($C_{31}H_{48}O_{12}$).).

The light-brown dehaired seeds of strophanthus gratus are cold pressed to free from oil. The oil free cakes thus formed are broken up and extracted with 96 per cent. alcohol. The alcohol is distilled off on the water bath, leaving a residue, which is described as follows: It consists of several layers—an upper thin layer of oil, then an aqueous alcohol layer, followed by a yellowish brown mass of crystals, under which is a layer of a brown extract, from which an amorphous strophanthin can be isolated. The above mentioned crystals are freed from the mother liquor and recrystallized from hot water. The seeds yield about 3.62 per cent. of crystallized strophanthin.

Colorless quadratic crystals of bitter taste and easily soluble in hot water. Soluble in 100 parts of cold water and 30 parts cold absolute alcohol and 30 parts amyl alcohol. It is slightly soluble in acetic ether, ether and chloroform. Its solubilities require further study. Solutions of 1 part of crystallized strophanthin in 100 parts of 95 per cent. alcohol have been frequently observed to deposit crystals on standing.

A solution of 0.01 gm. in 1 Cc. water run onto a layer of concentrated sulphuric acid colors the latter pink to red and the aqueous layer is colored a dirty green color.

Heated to 105° C. (221° F.), it loses 20 per cent. of water. The strophanthin thus dried melts at 187° to 188° C. (368.6° to 370.4° F.). Upon ignition no weighable residue should remain.

Heating with dilute hydrochloric acid or sulphuric acid produces hydrolytic cleavage, yielding a body which is identical with rhamnose.

Action and Uses.—Its pharmacologic action is probably qualitatively identical with that of the official strophanthus or strophanthin, but the crystallized is more than twice as active as the official strophanthin when injected subcutaneously or intravenously. The action of crystallized strophanthin appears to be identical with that of the purest preparation of strophanthin from Strophanthus Kombé; this action develops more rapidly, the drug is more quickly excreted, and shows less tendency to cumulative action than is the case with digitalis.

Strophanthin Thoms is used in place of strophanthus as a substitute for digitalis.

Dosage.—It is recommended in doses of 5 minims of a 1 per cent. solution by the mouth, gradually increased by 1 minim until the desired effect is obtained, which seldom requires more than ten minims (or about one-tenth of a grain of strophanthin). (H. Schedel, Arbeit a. d. Pharm. Inst. d. Universität, Berlin, II, 1904, p. 97). Single dose by mouth, 0.003 to 0.025 Gm. (1/20 to 2/5 grain); daily dose, up to 0.03 Gm. (½ grain). The larger doses are probably not absolutely safe. Intramuscularly or intravenously: The correct dose has not been accurately determined, but it appears to be one-half milligram (1/130 grain) or less for a single dose, and only one such dose should be given in a day as a rule. For intramuscular injection it should be dissolved in about 4,000 parts of distilled water, and even in that dilution it occasions some pain. The intramuscular injection should be repeated only by the physician himself.

SUBLAMINE—Mercuric Sulphate-Ethylenediamine.—Sublamine, $HgSO_4.2C_2H_4(NH_2)_2 + 2H_2O$, is a compound of one molecule of mercuric sulphate with two molecules of ethylenediamine (which see).

It forms white needles, readily soluble in water and in 10 parts of glycerin, sparingly soluble in alcohol. It has an alkaline reaction; it contains about 44 per cent. of mercury. It does not precipitate albumin from its solutions.

It is incompatible with sodium chloride and should not be exposed to the air.

Actions and Uses.—Sublamine is a disinfectant, similar to mercuric chloride, over which it has the advantage of being non-irritating, more penetrating and readily soluble.

It is used as a substitute for mercuric chloride for hand disinfection, as well as in dermatology, gynecology, ophthalmology and otology.

Dosage.—It is used in a 1:1,000 solution for skin disinfection and in 1:5,000 solution for irrigations of the bladder, etc. It may be used in syphilis by injection into the gluteal muscles of a 3 or 4 per cent. solution.

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin, Germany (Schering & Glatz, New York). U. S. patent No. 726,126 (April 21, 1903; expires 1920). U. S. trademark No. 37,736.

SULPHANILIC ACID.—Acidum Sulphanilicum.—Acidum Sulfanilicum (Pharm. Helvetica, edit. 4).—Sulphanilic acid, $C_6H_4(NH_2)(HSO_4)$ 1:4, is para-amino-benzene-sulphonic acid.

Twenty-five Gm. colorless aniline are gradually added to 75 Gm. concentrated sulphuric acid in a 250 Cc. flask and the mixture warmed to 180° to 190° C. (356° to 374° F.), under agitation for about three hours or until a drop of the mixture dropped into a solution of potassium hydroxide no longer gives indication of the presence of aniline. At the end of the reaction the mixture is poured into 500 Cc. cold water which precipitates the sulphanilic acid as a grayish crystalline powder; it is treated with animal charcoal and recrystallized from hot water (Hager 1, p. 116).

It occurs as colorless crystals slightly soluble in water, and insoluble in alcohol and ether. It is decomposed at 280° to 300° C. (536° to 572° F.). It effloresces in air. It is soluble in 182 parts water at 0° C. (32° F), and in 166 parts water at 10° C. (50° F.). it is not altered by boiling alkali, but fusion with alkali decomposes it, yielding aniline. Chromic acid mixtures oxidize it to chinon. Permanganate oxidizes it to azo-beuzene-sulphonic acid and an excess of this reagent to carbon dioxide, sulphuric acid, ammonia and oxalic acid. The cold saturated solution is not altered by hydrogen sulphide or barium chloride, but boiling with alkali should produce a visible change (Pharm. Helvetica, edit. 4). One Gm. of the powdered acid treated with 3 Cc. zinc chloride solution should not be darkened. It should leave no residue on ignition (Pharm Helvetica, edit 4).

Uses and Dosage.—Internally (of doubtful value) in chronic catarrh of the respiratory mucosæ, 0.5 to 2 Gm. (10 to 30 grains) three times a day. It may be rendered more soluble by sodium bicarbonate. Its most important use is in Ehrlich's diazo-reaction for typhoid urines.

Proprietary Preparation:

SOLOID NIZIN.—Tablets, each of which contains 0.13 Gm. (2 grains) of zinc sulphanilate, $Zn(C_6H_4(NH_2)SO_3)_2 + 4H_2O = Zn(C_6H_6O_3NS)_2 + 4H_2O$.

Actions and Uses.—Soloid Nizin is said to be an astringent and antiseptic. It is said to be useful in gonorrhea, in conjunctivitis and other eye affections.

Dosage.—One to three in 30 Cc. (one fluidounce) of water for urethral injection. One in 60 Cc. (2 fluidounces) for an eye lotion.

Prepared by Burroughs, Wellcome & Co., London, England, and New York. U. S. trademark No. 287,163.

SULPHONMETHANE.

Sulphonmethane is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physician's Manual of the Pharmacopeia and National Formulary.

SULPHONAL.—A name applied to Sulphonmethanum, U. S. P.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 391,875 (expired).

SULPHONETHYLMETHANE.

Sulphonethylmethane is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physician's Manual of the Pharmacopeia and National Formulary.

TRIONAL.—A name applied to Sulphonethylmethanum, U. S. P.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 396,526 (expired).

SULPHURATED POTASH—Potassa Sulphurata—Kalium sulphuratum crudum—Hepar Sulfuris.—Sulphurated potash is a mixture of salts of potassium, of which the chief are potassium sulphides (Br. Pharm., p. 259).

It is prepared as follows: Mix the powdered and dried potassium carbonate thoroughly with the sublimed sulphur, and gradually heat the mixture, in a covered crucible, which should be only about half filled with it, until the mass ceases to foam and is in a state of perfect fusion. Then pour the fused mass on a cold marble slab, and, after it has cooled, break it into pieces, and keep it in a well-stoppered bottle (U. S. P., 1890, p. 313).

When freshly prepared, sulphurated potassa forms irregular pieces of a liver-brown color, which, by exposure to the air, gradually absorb moisture, oxygen and carbon dioxide, and change to a greenish-yellow and finally to a gray mass containing potassium carbonate, thiosulphate and sulphate. The compound has a faint odor of hydrogen sulphide, and a bitter, alkaline taste.

Soluble in 2 parts of water at 15° C. (59° F.), with the exception of a small residue. Alcohol dissolves only the potassium sulphide, leaving the other constituents (thiosulphate and sulphate) undissolved.

The aqueous solution (1 in 10) is of an orange-yellow color, is strongly alkaline to litmus paper, and gives off the odor of hydrogen sulphide.

On adding to it acetic acid in slight excess, an abundance of hydrogen sulphide is evolved, while sulphur is precipitated.

In this liquid, after filtration, sodium bitartrate test solution produces an abundant, white, crystalline precipitate (U. S. P., 1890, p. 213).

On triturating 1 Gm. of sulphurated potassa with 1 Gm. of crystallised copper sulphate and 10 Cc. of water, and filtering, the filtrate should remain unaffected by hydrogen sulphide test solution, corresponding to at least 12.85 per cent. of sulphur combined with potassium to form sulphide (U. S. P., 1890, p. 313).

Actions and Uses.—Externally sulphurated potash acts as an irritant and softens the horny layers of the skin, acting especially on the hairs. Internally, it is a gastrointestinal irritant and is believed to be an alterative. In some cases it has produced severe poisoning from the amount of hydrogen sulphide evolved. It is employed externally[1] as a local irritant in various skin diseases and as a parasiticide.

TANNALBIN—Albuminis Tannas.—Tannate of Albumin.—Tannalbin is a compound of tannic acid and albumin thoroughly exsiccated.

It is prepared by precipitating 10 parts of a 10 per cent. solution of egg albumin with 6.5 parts of a 10 per cent. solution of tannic acid, washing the precipitate with water until the washings react only faintly with ferric chloride, drying it on porous tiles, powdering, and heating the product at 126° C. (258.8° F.) for six hours.

It is a light brown, odorless and tasteless powder, containing about 50 per cent. of tannic acid. It is practically insoluble in water or alcohol, but slowly soluble in alkaline fluids, which split it up into its constituents.

The filtrate obtained after shaking tannalbin with water should give, at most, a faint reaction with ferric chloride.

It is incompatible with alkaline liquids.

Actions and Uses.—Tannalbin is astringent. Being insoluble in the gastric juice, it becomes effective when it reaches the intestines, where it slowly splits off tannic acid. It does not produce gastric disturbance.

It is said to be useful in diarrhea, especially in that of children, and in phthisis.

Dosage.—1 to 4 Gm. (15 to 60 grains) in powder (or tablets) followed by water; infant doses, 0.3 to 0.5 Gm. (5 to 8 grains) in gruel or other mucilaginous liquid.

Manufactured by Knoll & Co., Ludwigshafen a. R., Germany, and New York. U. S. patent No. 563,479 (July 7, 1896; expires 1913). U. S. trademark No. 28,348.

TANNIGEN—Acidum Tannicum Diacetylicum.—Diacetyl-Tannin.—Tannigen is tannyl acetate, $C_{14}H_8(C_2H_3O)_2O_9 = C_{18}H_{14}O_{11}$, the acetic acid ester of tannin.

It is prepared by heating tannin and acetic anhydride, in molecular proportions, in the presence of glacial acetic acid in a flask under a reflux condenser, pouring the product of the reaction into water, washing the precipitate produced with warm water, drying and powdering.

It is a light-gray, almost odorless and tasteless powder, which undergoes no change when heated alone, even to 180° C. (356° F.), but softens when heated in water at 50° C. (122° F.). It is practically insoluble in cold water, scarcely soluble in hot water, but soluble in alcohol, and also in solutions of borax, sodium phosphate, sodium carbonate, lime, etc., being reprecipitated from these solutions by acids. It is rapidly saponified by boiling sodium or potassium hydroxide solutions, or gradually in the cold, into acetic and gallic acids, while ammonia produces acetic and tannic acids.

Its aqueous solutions produce with ferric salts a green color, instead of the blue-violet color characteristic of tannic acid. A slightly alkaline solution in sodium phosphate exhibits all the characteristics of an astringent and precipitate albumin, but these properties are destroyed by borax or more alkali.

It is incompatible with alkalies and with salts of iron; it should not be exposed to heat or moisture.

Actions and Uses.—Tannigen passes unchanged into the intestine, where it becomes effective as an astringent in contact with the alkaline juice. It is said to be free from irritant action. (See note under Cresosote Carbonate.)

It is said to be useful in acute diarrheal affections, such as acute intestinal catarrhs, cholera morbus, cholera infantum and dysentery; it has also been used with reported success for the diarrhea of typhoid fever and intestinal tuberculosis.

Dosage.—0.2 to 0.7 Gm. (3 to 10 grains) four times per day, dry on the tongue followed by a swallow of water; or mixed with food, avoiding warm or alkaline liquids.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York.) U. S. patent No. 533,718 (Feb. 5, 1895; expires 1912). U. S. trademark No. 17,668.

TANNISMUTH—Bismuthi Bitannas.—Bitannate of Bismuth. Tannismuth is the bismuth salt of tannic acid in which approximately one atom of bismuth is combined with two molecules of tannic acid having approximately the formula $Bi(OH)(C_{14}H_9O_9)_2$, and containing between 17 and 21 per cent. bismuth.

It is a light yellow powder with slightly astringent taste, insoluble in water, soluble in cold caustic alkalies, and in diluted hydrochloric acid.

Actions and Uses.—It is claimed that one molecule of the tannic acid becomes operative immediately after ingestion, while the other is slowly separated and prolongs the astringent action throughout the entire length of the alimentary canal.

It is said to be useful in chronic intestinal catarrh, involving different portions of the intestinal tract.

Dosage.—0.3 to 0.6 Gm. (5 to 10 grains) three to five times daily.

Manufactured by Chemische Fabrik von Heyden, Radebeul near Dresden, Germany (The Heyden Chemical Works, New York). Not patented in the United States. German patent No. 172,933. U. S. trademark No. 36,916.

TANNOFORM — Tanninformaldehydum. — Tanninformaldehyde—Methylenditannin—Tannoform, $CH_2(C_{14}H_9O_9)_2 = C_{29}H_{20}O_{18}$, is a condensation product of formaldehyde with gallo-tannic acid.

It is prepared by mixing solutions of formaldehyde and tannic acid, precipitating with concentrated hydrochloric acid, washing the precipitate with water, and drying.

It forms a voluminous, reddish powder, odorless and tasteless. It is insoluble in water, but soluble in alkaline liquids and in alcohol. 0.01 Gm. of tannoform dissolved in 2 Cc. concentrated sulphuric acid forms a brown solution which on warming becomes green and later changes to blue. The green or blue solution, on addition of alcohol, assumes a brilliant blue color, which gradually changes to wine color, while on addition of dilute sodium hydroxide the color is pale green.

Its incompatibilities are those of tannin generally.

Actions and Uses.—Tannoform is astringent and antiseptic. It is said to be useful an account of these properties in chronic intestinal catarrh and externally in hyperidrosis, bromidrosis, weeping eczema, ozena, etc.

Dosage.—0.25 to 0.5 Gm. (4 to 8 grains); externally, pure or in 25 to 50 per cent. triturations (with talc) as dusting powder, or as 10 per cent. ointment or soap.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). German patents Nos. 88,082 and 88,841.

TANNOPIN—Hexamethylene-Tetramine-Tannin.—Tannon.—Tannopin, $(C_{14}H_{10}O_9)_3.(CH_2)_6N_4 = C_{48}H_{46}O_{27}N_4$, is a condensation product of tannin with hexamethylenamine

It is prepared by mixing molecular proportions of solutions of hexamethylenamine and tannic acid, collecting, washing and drying the precipitate.

It is a fine, fawn-colored, odorless and tasteless, non-hygroscopic powder, containing 87 per cent. of tannin and 13 per cent. of hexamethylenamine. It is insoluble in water, weak acids, alcohol, chloroform or ether, but slowly soluble in dilute alkalies. On heating dry tannopin, it swells and gives off the odor of formaldehyde. The odor of formaldehyde is also developed on heating tannopin with dilute sulphuric or hydrochloric acid, while on boiling with sodium hydroxide solution it splits off ammonia. The clear aqueous filtrate from tannopin does not give a reaction with ferric chloride.

It is incompatible with alkalies.

Actions and Uses.—Tannopin has an astringent and antiseptic action in the intestine; it passes unchanged through the stomach, but, being gradually decomposed by alkalies, it becomes effective in the intestinal tract, exerting the action of its two components.

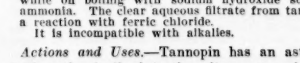
It is said to be useful in acute, subacute or chronic intestinal catarrh, in tuberculous enteritis, and other intestinal disorders.

Dosage.—0.3 to 0.5 Gm. (5 to 8 grains) for infants and children; 1 Gm. (15 grains) for adults, dry on the tongue, followed by a swallow of water, or sprinkled on food, four times a day.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent No. 607,172 (July 12, 1898; expires 1915). U. S. trademark No. 31,527.

THEOBROMINE AND THEOBROMINE COMPOUNDS.

THEOBROMINE—Theobromina. — 3,7-Dimethyl-Xanthine.—Theobromine is 3,7-dimethyl xanthine,



$N(CH_3).CH:C.N(CH_3)$ / $CO = C_7H_8O_2N_4$, a base occurring in $CO{-}NH.C{=}N$

1. In view of the uncertainty of the composition of sulphurated potash and of the fact that it sometimes exerts a poisonous action, it is deemed suitable only for external use.

Theobroma cacao, Kola acuminata, etc., and also made synthetically. Theobromine is closely related to caffeine (1,3,7 trimethyl xanthine).

It is a white, crystalline powder, odorless and bitterish. It is almost insoluble in cold water or chloroform, readily soluble in hot alcohol and in ether. It forms salts with acids.

Actions and Uses.—Its uses are similar to those of caffeine, but its action is said to be relatively greater on the heart and muscles and also as a diuretic. It does not act so powerfully on the central nervous system.

It is used as a diuretic. The great obstacle to its use has been its insolubility and the consequent uncertainty of the degree of its absorption. It is liable to produce gastric disturbances.

Dosage.—0.35 to 0.5 Gm. (5 to 8 grains).

AGURIN — Theobrominæ Sodio-Acetas. — Theobromine-Sodium-Acetate.—Agurin, $NaC_7H_7N_4O_2 + NaC_2H_3O_2$, is a double salt of sodium acetate and theobromine-sodium.

It is prepared by adding to a solution of one molecule of sodium hydroxide one molecule of theobromine. To this solution of sodium theobromine one molecule of sodium acetate is added and the solution brought to dryness.

It is a white, finely crystalline powder, containing 60 per cent. of theobromine. It is freely soluble in water, not very readily soluble in cold, more so in hot, alcohol. It is quite hygroscopic, and in watery solutions gradually splits up into its components, and more readily in the presence of carbon dioxide.

It is precipitated and decomposed by carbon dioxide and by acids; it forms a bluish white precipitate with silver nitrate, a blue precipitate with copper sulphate, white with tartar emetic, red-brown with ferric salts. It is not readily precipitated by Mayer's reagents, nor by iodine.

It is incompatible with carbonated beverages, acids, saccharine and mucilaginous liquids, and most of the alkaloid reagents.

Actions and Uses.—It acts like theobromine, over which it has the advantage of great solubility and that it is well tolerated by the stomach. While inferior in diuretic power to theophyllin (which see), it is said to have greater power in sustaining the diuresis produced.

Dosage.—0.5 to 1 Gm. (7 to 15 grains), preferably in wafers or capsules. If in solution, this should be freshly prepared (with peppermint water) and without sugar or mucilage.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. trademark.

Tablets Agurin, 5 grains. Each tablet contains agurin 0.33 Gm. (5 grains).

THEOBROMINE SODIUM SALICYLATE — Theobrominæ Sodio-Salicylas.—Theobromine sodium salicylate, $NaC_7H_7N_4O_2 + NaC_7H_5O_3$, is a double salt of theobromine-sodium and sodium salicylate. It is official in the German Pharmacopeia as Theobrominum natrio-salicylicum.

It is prepared by adding to a solution of one molecule of sodium hydroxide one molecule of theobromine. To this solution of sodium theobromine one molecule of sodium salicylate is added and the solution brought to dryness.

It is a white powder, odorless, having a saline taste, and containing 50 per cent. of theobromine. It is freely soluble in water, and, like "theobromine sodium-acetate" (see Agurin) is readily decomposed by exposure to carbon dioxide or by the action of acids. It must therefore be preserved in well-stoppered bottles.

The aqueous solution (1 to 5) is colorless, turns litmus paper blue and after acidification with acetic acid assumes a violet coloration on addition of ferric chloride solution. From the solution, hydrochloric acid precipitates salicylic acid, and, after a time, also theobromine, the precipitate being completely soluble in sodium hydroxide solution, but not in ammonia water. If 10 Cc. of the solution, rendered clear by the addition of sodium hydroxide solution, is shaken with 10 Cc. of chloroform, the chloroform when separated and evaporated should leave a residue not exceeding 0.005 Gm. for 1 Gm. theobromine sodium salicylate.

It is incompatible with acids, bicarbonates, borates, phosphates, ferric salts, hydrated chloral, etc.

Actions and Uses.—Its effects are the same as those of theobromine (which see), over which it has the advantage of greater solubility.

Dosage.—1 Gm. (15 grains) five or six times a day. Its tendency to produce gastric irritation may be prevented by giving it in well-diluted solution, or, if preferred, in capsules or wafers, followed by water.

THEPHORIN—Theobrominæ Sodio-Formas. — Theobromine Sodium Formate. Thephorin is theobromine sodio-formate, $NaC_7H_7N_4O_2 + NaCHO_2 + H_2O$, a double salt of sodium formate and theobromine sodium.

It is prepared by dissolving 70.1 parts of theobromine sodium in 200 parts of water and adding to it a solution of 23.5 parts of anhydrous sodium formate in 50 parts of water, filtering the mixture, and evaporating to dryness on a steam bath or in vacuo.

Thephorin is a white, odorless powder having a saline bitter taste and is readily soluble in water producing an alkaline solution. From its aqueous solution the theobromine is precipitated by acetic acid. In the filtrate formic acid is indicated by the reduction of silver nitrate.

If an aqueous solution of thephorin be faintly acidulated with nitric acid, the filtrate should give no precipitate with barium chloride, nor with silver nitrate, nor with ammonia water and hydrogen sulphide.

Two Gm. thephorin are placed in a porcelain dish and dissolved in 10 c.c. water with the aid of gentle heat. A few drops of phenolphthalein test solution are placed in the solution, neutralized with nitric acid, the faint alkaline reaction is again restored by means of diluted ammonia, the solution is then thoroughly stirred and, with frequent stirring, allowed to stand for three hours at ordinary temperature.

The resulting precipitate collected on a weighed filter of 8 cm. diameter, is dried at a temperature of 100 C.; it is then washed twice with cold water, using 10 Cc. each time. The filter is again dried at a temperature of 100 C. and weighed. The weight of the precipitate should amount to 1.2 Gm.

Actions and Uses.—Thephorin is said not to irritate the stomach and acts as a powerful diuretic, both on account of the theobromine which it contains and also from the action of sodium formate.

It is said to be useful in cardiac affections, nephritis, dropsy, etc.

Dosage.—0.5 Gm. (7½ grains) two or three times a day in the form of powder or as tablets.

Manufactured by F. Hoffmann-LaRoche & Co., Basel, Switzerland (The Hoffmann-LaRoche Chemical Works, New York). U. S. patent No. 799,764 (Sept. 19, 1905; expires 1922). U. S. trademark No. 59,581.

Thephorin Tablets, 7 1/2 grains: Each tablet contains thephorin 0.5 Gm. (7½ grains).

UROPHERIN-B—Theobrominæ et Lithii Benzoas. — Theobromine and Lithium Benzoate—Uropherin Benzoate.—Uropherin-B is theobromine lithio-benzoate, $LiC_7H_7N_4O_2 + LiC_7H_5O_2$, a double salt of theobromine-lithium and lithium benzoate.

It is a white powder containing 50 per cent. of theobromine. It is soluble in 5 parts of water; it decomposes on exposure to light and air.

A solution of uropherin-B will respond to the various tests for lithium, theobromine and benzoate.

Actions and Uses.—It is a diuretic, said to be particularly efficient in connection with digitalis.

It is said to be useful in dropsy, nephritis and diseases of the heart and of the genitourinary organs.

Dosage.—0.3 to 1 Gm. (5 to 15 grains) in powder or capsules, followed by water.

Manufactured by E. Merck, Darmstadt (Merck & Co., New York). U. S. trademark.

UROPHERIN-S—Theobrominæ et Lithii Salicylas.—Theobromine and Lithium Salicylate—Uropherin Salicylate.—Uropherin-S is theobromine lithio-salicylate, $LiC_7H_7N_4O_2 + LiC_7H_5O_3$, a double salt of theobromine-lithium and lithium salicylate.

Actions and Uses.—The properties, actions, uses and dosage of this compound are practically the same as those of "theobromine-lithium benzoate" (see Uropherin-B).

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. trademark.

THEOPHYLLINE AND THEOPHYLLINE COMPOUNDS.

THEOPHYLLIN—Theophyllina. — 1,3-Dimethyl-Xanthine.—Theophyllin is 1,3-dimethyl-xanthine,

$$\begin{array}{l} N(CH_3).CO.C.NH \\ | \quad\quad\quad\quad\quad\quad \diagdown \\ CO.N(CH_3).C.N \quad\quad // \end{array} CH + H_2O = C_7H_8O_2N_4 + H_2O,$$

an organic base isomeric with theobromine; it is found in small amounts in tea and is also made synthetically.

It is a white odorless, crystalline powder, having a bitter taste, and melting at 268° C. (514.4° F.). It is soluble in 180 parts of water at ordinary temperature and in 85 parts at 37° C. (98.6° F.), sparingly soluble in alcohol, insoluble in ether. It forms easily soluble compounds with ammonium and potassium, a less soluble salt with sodium, but a freely soluble double salt with sodium acetate.

It responds to the murexid test. Addition of tannin to a solution of theophyllin produces a precipitate soluble in an excess of the reagent. It is soluble in an excess of sodium hydroxide solution (difference from caffeine). On addition to solution of theophyllin in sodium hydroxide of a solution of sulphanilic acid 0.5, hydrochloric acid 5.0, water 100, to which a few drops of a ½ per cent. solution of sodium nitrite have been added (diazo test), a red coloration is produced (distinction from caffeine and theobromine).

Actions and Uses.—Theophyllin has a diuretic action similar to that of caffeine or theobromine but is more effective. The

diuretic effect, however, is not prolonged and its administration is, therefore, advantageously followed by one of the theobromine derivatives having a weaker, but more persistent, action. It occasionally produces gastric disturbances and renal irritation has also been reported. It is claimed that these may be obviated by the use of theophyllin sodio-acetate (which see) instead.

It is used in cardiac affections, nephritis, dropsy, etc.

Dosage.—0.2 to 0.35 Gm. (3 to 5 grains) in warm tea.

Proprietary Preparations:

THEOPHYLLIN (Boehringer) is prepared by transformation of uric acid.

Manufactured by C. F. Boehringer & Soehne, Mannheim, Germany. (Merck & Co., New York.) U. S. patent Nos. 667,381 (Feb. 5, 1901; expires 1918); 757,328; 757,329 (April 12, 1904; expires 1921).

THEOCIN:—A name applied to theophyllin manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). It is prepared by treating the monoformyl derivative of 1-3 dimethyl-4-5-diamido-2-6-dioxypyrimidin with alkalies. The alkaline salts of theophyllin thus produced are transformed into theophyllin by the action of acids.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany. (Farbenfabriken of Elberfeld Co., New York.) U. S. patent No. 716,994 (Dec. 30, 1902; expires 1919). U. S. trademark No. 39,135.

THEOPHYLLIN SODIO-ACETATE—Theophyllinæ sodio-acetas—Theophyllin sodium-acetate $C_7H_7N_4O_2Na + CH_3COONa + H_2O$, is a double salt of sodium acetate and 1, 3-dimethylxanthine-sodium (theophyllinsodium).

It is a white crystalline powder, containing about 60 per cent. of anhydrous theocin. It dissolves in about 20 parts of water at 25° C. (77° F.), but is insoluble in alcohol or ether.

Actions and Uses.—It has the diuretic properties of theophyllin reinforced by the diuretic action of sodium acetate, and being more soluble, it is claimed to be more readily absorbed and to be better tolerated than theophyllin.

It is said to be useful in cardiac affections, nephritis, dropsy, etc.

Dosage.—0.2 to 0.35 Gm. (3 to 5 grains), best given after meals.

Proprietary Preparations:

ACET-THEOCIN SODIUM.—A name applied to Theophyllin-Sodio-Acetate.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany. (Farbenfabriken of Elberfeld Co., New York.) U. S. patent No. 716,994 (Dec. 30, 1902; expires 1919). U. S. trademark No. 39,135.

Acet-Theophyllin Sodium.—A name applied to Theophyllin-Sodio-Acetate.

Manufactured by C. F. Boehringer & Soehne, Mannheim, Germany (Merck & Co., New York). U. S. patent Nos. 667,381 (Feb. 5, 1901; expires 1918); 757,328; 757,329 (April 12, 1904; expires 1921).

THERMODIN — Phenacetin-Urethane. — Acetylparethoxy-Phenyl-Urethane.—Thermodin, $C_6H_4(OC_2H_5).(N(COOC_2H_5)(CH_3CO)) = C_{13}H_{17}O_4N$, **is a compound of acetphenetidin (phenacetin) and ethyl carbamate (urethane). It is chemically related to acetphenetidin (phenacetin), but differs from the latter in that it contains the group** $[N(COOC_2H_5)(CH_3CO)]$ **in place of** $(NH.CO.CH_3)$.

It is prepared by the action of ethyl chlorocarbonate on paraphenetidin by which parethoxyphenyl-urethane is formed which is converted into the acetyl compound by heating with acetic anhydride.

It forms colorless, odorless and tasteless crystals, melting at 86° to 88° C. (186.8° to 190.4° F.). It is practically insoluble in cold water (1:2600); soluble in 450 parts of boiling water.

If 0.5 Gm. of thermodin, 5 Cc. sulphuric acid, and 5 Cc. of alcohol are mixed and warmed gently, the odor of ethyl acetate is developed. A solution of 0.5 Gm. of thermodin in 5 Cc. of sulphuric acid on the addition of 0.2 Gm. of sucrose, assumes a red color, becoming more intense on standing (distinction from neurodin). If 0.5 Gm. of thermodin is boiled with 3 Cc. of hydrochloric acid during one minute, then mixed with 5 Cc. phenol solution 1:20, and a solution of chlorinated lime added, an onion red color appears which changes to blue on supersaturation with ammonium hydroxide. 0.1 Gm. of thermodin dissolved in 5 Cc. of sulphuric acid should form an almost colorless solution. 0.1 Gm. of thermodin should, on ignition, not leave a weighable residue.

Actions and Uses.—Thermodin is an analgesic, antipyretic and antiseptic.

It is recommended as a mild and reliable antipyretic in typhoid fever, pneumonia, influenza, tuberculosis and febrile conditions in general, and is said to be free from unpleasant by-effects. There is every reason to believe, however, that for use in these infectious diseases it is open to the same objection as the other derivatives of acetphenetidin and related products. (See Acetphenetidin.)

Dosage.—0.3 to 0.6 Gm. (5 to 10 grains) as an antipyretic; 1 to 1.3 Gm. (15 to 20 grains) as an analgesic.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. trademark.

THIGENOL.—Solution of Sodium Sulpho-Oleate, Roche.—Thigenol is a solution of the sodium salts of synthetic sulpho-oleic acids, containing 2.85 per cent. sulphur.

Precipitated sulphur is dissolved by boiling in the glyceride of oleic acid; the resulting solution is treated with sulphuric acid, during which process sulphurous acid escapes, and a sulpho-oleic acid is separated out. The separated sulpho-acid is then obtained by pouring into water, and subsequently washing thoroughly. By treatment with solution of sodium hydroxide, there results a solution of sodium sulpho-oleate, which is evaporated in vacuo until it has a specific gravity of 1.05 to 1.06.

Thigenol is a dark brown liquid, having a faint sulphurous odor. It is soluble in one or more parts of water, dilute alcohol, glycerin, chloroform, oily or fatty bases, with any one of which it mixes freely. When water is the vehicle employed, it should be distilled; hard water will cause a precipitate. Thigenol is incompatible with mineral acids or acetic acid.

Actions and Uses.—Thigenol is said to have the actions of sulphur. It is claimed to stimulate granulation, restrict secretions and to be antipruritic.

It is used in diseases of the uterus and its appendages and in skin diseases in which sulphur is commonly employed.

Dosage.—0.2 to 0.6 Gm. (3 to 10 grains) in plain or sweetened water. Thigenol is used locally either in the pure state or mixed in any desired proportion with ointment bases, fats or glycerin according to the intensity of action required.

Manufactured by F. Hoffmann-LaRoche & Co., Basel, Switzerland. (The Hoffmann-LaRoche Chemical Works, New York). U. S. trademark No. 51,393. Not patented.

THIOL.—Thiolum.—Thiol is a water soluble mixture of sulphurated and sulphonated petroleum oils.

Thiol is prepared by heating certain paraffin oils with 10 per cent. of sulphur, by which a partial addition of the sulphur takes place. The thiol oil thus formed is then treated with sulphuric acid for sulphonization. The excess of sulphuric acid is washed out by water and the sulphonated product neutralized by ammonia and the solution freed by dialysis from all inorganic salts. The dialyzed product evaporated to dryness contains about 12 per cent. of sulphur. For therapeutic purposes the evaporation is not carried to absolute dryness but the product is marketed either in the form of a syrupy liquid (Thiol Liquid, see below) or as a powder (Thiol Dry, see below).

Thiol is a brown powder with a pleasant odor resembling Russia leather, having a somewhat bitter and slightly astringent taste. It swells up in water and finally dissolves. It is also soluble in alcohol and slightly soluble in ether.

Thiol should not markedly redden litmus paper.

Actions and Uses.—Thiol is said to have a drying, astringent, antiphlogistic, and disinfecting action. Taken internally it is said to favor digestion and defecation. It is said to be useful in skin diseases, especially in dermatitis, acne, eczema, erysipelas, erythema, furunculosis, herpes, pruritus, pityriasis, etc. It is also claimed to be useful in burns, in rheumatism and in certain diseases of women.

Dosage.—It may be applied locally in the form of liquid thiol in full strength or in solution with glycerin or water or in the form of ointment or a 2 per cent. solution of liquid thiol may be used as a spray. Internally it may be given in the form of dry thiol in the dose of 0.1 to 0.2 Gm. (1½ to 3 grains) three times a day. Dry thiol may be employed as a dusting powder, either alone or with 80 per cent. of starch or in the form of ointment or of paste.

Manufactured by J. D. Riedel Aktiengesellschaft, Berlin, Germany (Riedel & Co., New York). U. S. trademark 16,553.

Thiol Dry.—Thiolum Siccum.—Thiol Dry is a brown powder with properties corresponding to the description of thiol, containing from 8 to 9 per cent. of sulphur.

Actions, Usage and Dosage.—See Thiol.

Thiol Liquid.—Thiolum Liquidum.—Thiol liquid is a preparation of thiol containing about 1.8 to 2 per cent. of sulphur.

It is a dark brown neutral liquid of a not unpleasant smell resembling that of Russian leather. It is easily soluble in water and glycerin but only slightly soluble in ether.

Actions, Uses and Dosage.—See Thiol.

THIOSINAMINE AND THIOSINAMINE COMPOUNDS.

THIOSINAMINE—Thiosinamina.—Allyl Sulphocarbamide—Allyl Thiourea—Rhodaline.—Thiosinamine is allyl-thio-urea, $(NH_2).CS.NHCH_2.CH:CH_2 = C_4H_8N_2S$.

It is prepared by warming together volatile oil of mustard (chiefly allyl thiocyanate) and alcoholic solution of ammonia, collecting the crystalline product of condensation, and recrystallizing from alcohol.

It forms colorless crystals, having a slight allaceous odor and bitter taste and melting at 74° C. (165.2° F.). It is moderately soluble in water, but is decomposed by this solvent. It is soluble in about 3 parts of alcohol and readily soluble in ether.

It is incompatible with water, which decomposes it, but this change is to a limited extent prevented by the presence of glycerin.

Actions and Uses.—Thiosinamine appears to cause or quicken the absorption of exudates, lymphatic swellings, scar tissue, etc., the action being unexplained. The opinions as to its value are contradictory.

It is used by hypodermic injection in lupus, chronic glandular tumors, cicatrices, etc. By the mouth in stricture, corneal opacity, chronic deafness.

Dosage.—0.03 to 0.1 Gm. (½ to 1½ grains) in capsules or tablet triturates; in subcutaneous injections, 0.05 to 0.2 Gm. (1 to 5 grains) in 15 per cent. alcoholic or 10 per cent. glycerinated water solution.

SOLUTION THIOSINAMINE SODIUM SALICYLATE.—Liquor Thiosinaminæ Sodio-Salicylatis.—A sterilized solution containing 15 per cent. of a double salt of thiosinamine and sodium salicylate, $(NH_2.CS.NHCH_2.CH:CH_2)\ C_6H_4(OH)\ (COO\ Na)$.

It is prepared by mixing the two compounds in solution.

It is an aqueous odorless solution. It does not keep well in the air, but is marketed in sealed, brown glass vials, each containing 2.3 Cc. (37 minims) of the solution, equivalent to 0.2 Gm. (3 grains) of thiosinamine.

The tests are those of thiosinamine and sodium salicylate.

Actions and Uses.—Those of thiosinamine, with the advantage of quicker absorption and freedom from pain or irritation, on account of its solubility and aqueous vehicle.

Dosage.—The contents of one vial (2.3 Cc. = 0.2 Gm. thiosinamin) by subcutaneous, intramuscular or intravenous injection; one injection being administered daily or every second or third day.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. trademark No. 49,160.

THORIUM NITRATE—Thorii Nitras.—Thorium nitrate, $Th(NO_3)_4 + 4H_2O$, is the thorium salt of nitric acid.

Thorium nitrate occurs as white crystalline granules or lumps. Very soluble in water and alcohol. On calcination yields a voluminous, white oxide, which should amount to 48-50 per cent. of the original salt. The aqueous solution dries over sulphuric acid to a crystalline mass.

An aqueous solution gives a white precipitate with ammonium carbonate, the precipitate being completely soluble in an excess of the precipitant. The aqueous solution gives with caustic alkalies a voluminous precipitate of the hydroxide insoluble in an excess of the precipitant. The presence of tartaric acid prevents the precipitation. Potassium ferrocyanide produces an amorphous precipitate.

Action and Uses.—The soluble thorium salts bear a close resemblance to alum in their local astringent and irritant properties. They are not absorbed from the alimentary canal. Hypodermically, they cause local sloughing, and intravenously, they kill by coagulating the blood. The non-precipitant double salts are practically non-toxic, even intravenously. They are excreted by the kidneys. Thorium salts are fairly radioactive. They have been recommended for local application in malignant diseases and thorium emanation has been inhaled in phthisis. Reliable evidence as to the therapeutic value of thorium salts is lacking.

Dosage.—A solution of thorium nitrate (1 to 5) is neutralized with ammonia and allowed to stand in a bottle four-fifths full; the emanation that accumulates in the vessel is inhaled (Br. Codex).

THYMOL IODIDE.

Thymol Iodide is official in the United States Pharmacopeia. For description see the pharmacopeia or the Physicians' Manual of the Pharmacopeia and National Formulary.

ARISTOL.—A name applied to Thymolis Iodidum, U. S. P.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. trademark No. 17,393.

THYRESOL.—Thyresol consists chiefly of the methyl ether of santalol, $C_{15}H_{23}OCH_3$. It is prepared by the action of sodium methylate on "santal oil chloride."

Thyresol is a colorless liquid of aromatic odor, almost insoluble in water; easily soluble in alcohol and ether; soluble in concentrated sulphuric acid with a reddish-brown color. Boils at 149-156° C. (300.2-312.8° F.) under pressure of about 16 mm. On heating with hydriodic acid, santalyl iodide and methyl iodide are formed.

Actions and Uses.—Similar to sandal wood oil, but said to be practically free from irritant effects on the stomach and kidneys.

It is said to be useful in acute and chronic gonorrhea, anterior and posterior, and other conditions in which the sandal wood oil preparations are indicated.

Dosage.—0.5 Gm. (8 grains) 3 to 4 times daily, best given in milk or gelatin capsules.

Manufactured by Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld, Germany. (Farbenfabriken of Elberfeld Co., New York.) U. S. patent No. 909,541 (Jan. 12, 1909; expires 1926).

THYROID PREPARATIONS.

IODOTHYRINE—Thyroiodine.—Iodothyrine is a milk sugar trituration of the active principle of thyroid gland, 1 Gm. representing 1 Gm. of fresh gland and containing 0.0003 Gm. of iodine.

According to the patent specifications iodothyrine may be obtained by boiling the fresh thyroid glands, freed from fat, with dilute sulphuric acid, cooling the liquid and collecting the body which separates, dissolving the active portion in alcohol and evaporating to dryness. The product is further purified by washing with ether, which dissolves impurities. One part of the active ingredient is mixed with 309 parts of sugar of milk.

It is a white or yellowish white powder, having the sweet taste of milk sugar.

Actions and Uses.—It is similar in action to Glandulæ Thyroideæ Siccæ, U. S. P., but it is claimed to possess the advantage of more definite strength and absence of decomposable extraneous matter.

Dosage.—Adults, 0.6 to 2 Gm. (10 to 30 grains); children, 0.3 to 1 Gm. (5 to 15 grains) per day.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Farbenfabriken of Elberfeld Co., New York). E. Merck, Darmstadt (Merck & Co., New York). U. S. patent No. 626,648 (June 6, 1899; expires 1916). U. S. trademark No. 29,406.

Iodothyrine Tablets, 5 grains. Each tablet contains Iodothyrine 0.33 Gm. (5 grains).

TRIFERRIN—Triferrinum.—Triferrin is ferric paranucleinate; a compound of caseinparanucleinic acid with iron, containing 22 per cent. of iron, 9 per cent. of nitrogen and 2.5 per cent. of phosphorus in natural (organic) combination.

It is prepared by digesting cow's milk-casein with pepsin and precipitating the solution with a ferric salt.

It is a tasteless powder. It is soluble in weak solution of sodium hydroxide, but insoluble in weak hydrochloric acid (0.1 to 0.3 per cent.).

Actions and Uses.—In addition to its hematinic action derived from the iron, it is claimed to act like lecithin by reason of the phosphorus in organic combination which it contains. It is said to agree with very sensitive stomachs, since it passes the stomach unchanged but is freely absorbed in the intestines.

It is said to be useful in anemia, chlorosis, neurasthenia, rachitis and general debility.

Dosage.—0.3 Gm. (5 grains) in powder, taken during meals.

Manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany, and New York (Knoll & Co., New York). German patent No. 114,273. U. S. trademark No. 36,747.

Triferrol—Liquor Triferrini, Knoll.—Triferrol is an elixir of triferrin, said to contain 0.06 Gm. (1 grain) triferrin in 4 Cc. (1 fluidram). It contains 15 per cent. of alcohol.

A soluble form of triferrin (soluble triferrin Knoll), is dissolved in a vehicle consisting of water, alcohol, tincture of orange, tinct. cardamon co. and vanillin.

Dosage.—16 Cc. (4 fluidrams) corresponding to 0.24 Gm. (4 grains) of the powder.

TRIOXYMETHYLENE — Paraformaldehydum.—Paraformaldehyde.—Trioxymethylene, $(CH_2O)x$, is a polymeric condensation of formaldehyde.

It is prepared by concentrating an aqueous solution (40 per cent.) of formaldehyde by evaporation.

It is a white, crystalline powder, melting at 171° C. (339.8° F.). It is insoluble in alcohol or ether, but slowly soluble in water at ordinary temperature, more rapidly when heated, formaldehyde being regenerated as indicated by the vapors given off.

It responds to the tests for formaldehyde.

It has the same incompatibilities as formaldehyde: Bases, oxidizing agents, gelatin, tannin, etc.

Actions and Uses.—Antiseptic and escharotic. Externally it is used chiefly to generate formaldehyde by heating, for disinfection or for inhalations.

Dosage.—Internally, 0.3 to 1 Gm. (5 to 15 grains); externally (for warts), in 10 per cent. suspension in collodion.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). It is not patented or trademarked.

TRIPHENIN.—Propionyl-Phenetidin—Triphenin, $C_6H_4(OC_2H_5)NH(CH_2CH_2CO) = C_{11}H_{13}NO_2$, is a derivative of paraphenetidin, differing from acetphenetidin (phenacetin), $C_6H_4(OC_2H_5)NH(CH_3CO)$, in that the acetic acid residue, $(CH_3.CO)$, has been replaced by the propanoic acid residue, $(CH_3.CH_2.CO)$.

It is a white, shining, crystalline powder, melting at 120° C. (248° F.), odorless and faintly bitter. It is practically insoluble in water, requiring 2,000 parts, but soluble in alcohol and in ether.

It is prepared by heating paraphenetidin with propanoic acid and crystallizing the product.

In general it responds to the pharmacopoeial tests for acetphenetidin (phenacetin). From this it may be distinguished by its melting point and by identifying the propanoic acid evolved when heated with 50 per cent. sulphuric acid.

Its incompatibilities are those of acetphenetidin (phenacetin.)

Actions and Uses.—Triphenin is antipyretic, analgesic and hypnotic, its action is slower and milder than that of phenacetin, because it is less soluble, and it is said to be free from by- or after-effects.

It has been recommended in typhoid, pneumonia, pleurisy, influenza, erysipelas and tuberculosis; also in neuralgia, sciatica, migraine, tabetic pains, etc. Like similar products, it must be used with caution, especially in the infectious fevers. (See Acetphenetidin.)

Dosage.—As an antipyretic, 0.25 to 0.6 Gm. (4 to 10) grains); as an antineuralgic, 1 to 1.3 Gm. (15 to 20 grains), preferably in wafers.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 535,846 (March 19, 1895; expires 1912). U. S. trademark.

TROPACOCAINE HYDROCHLORIDE—Tropacocainæ Hydrochloridum.—Benzoylpseudotropeine Hydrochloride—Tropeine.—Tropacocaine hydrochloride, $C_8H_{14}NO(C_7H_5O.)HCl = C_{15}H_{19}NO_2.HCl$, is the hydrochloride of synthetic tropacocaine.

Pseudotropin-Lieberman is obtained from tropinon or from tropin by electrolytic reduction and from this the benzoyl derivative is obtained and this is converted to the hydrochloride.

It forms colorless, needle-shaped crystals, melting at 271° C. (519.8° F.). It is readily soluble in water, and its solution keeps well for several months. Heated in the presence of hydrochloric acid it is split into benzoic acid and tropine.

Its incompatibilities are the same as those of the alkaloids in general.

Actions and Uses.—Tropacocaine hydrochloride is a local anesthetic, resembling cocaine very closely in its general action, but only half as poisonous. It is reported that anesthesia sets in more rapidly and lasts longer than with cocaine. It produces less dilatation of the pupil, sometimes none at all. It is employed as a local anesthetic.

Dosage.—It is applied in 3 to 10 per cent. aqueous solutions containing 0.6 per cent. sodium chloride.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). U. S. patent No. 628,293 (July 4, 1899; expires 1916).

UREA.—Urea, $CO(NH_2)_2 = CH_4ON_2$, is the diamide of carbonic acid.

Urea occurs as colorless transparent prismatic crystals almost odorless having a cooling saline taste. It is somewhat hygroscopic. It is soluble in water (1-1), more readily in hot water. Soluble in alcohol (1-7) and (1-1) in boiling alcohol. It is insoluble in ether and chloroform. It fuses at 132° C. (269.6° F.), evolving ammonia and ammonium cyanate. Kept at 150° C. (302° F.) for some time most of it is converted to biuret. If the temperature is raised to 170° C. (338° F.) the biuret evolves ammonia and is converted to cyanuric acid. Heated with water under pressure it is decomposed into ammonium carbonate. It is not alkaline, but is a weak base and though a diamide, forms salts like a monacid base; these are acid to litmus. By hydrolysis it is converted into ammonia and carbon dioxide. Nitric and oxalic acids produce precipitates when added to concentrated solutions of urea.

Action and Uses.—Urea is an active diuretic; it is rapidly eliminated and is not poisonous. It has been claimed, without convincing proof, to have the power of dissolving urinary calculi. It has been recommended in the treatment of tuberculosis, but this use of it is generally being abandoned. It may be employed where diuresis is indicated, though it appears irrational in primary renal disease.

Dosage.—0.5 to 4 Gms. (10 to 60 grains). Urea is given in solution, or it may be enclosed in cachets.

VALIDOL.—Validol is menthyl valerianate, $C_{10}H_{19}O.C_5H_9O$, the menthylester of valerianic acid, with 30 per cent. of free menthol.

It is prepared by heating a mixture of 16 parts of menthol and 12 parts of valerylchloride on a water bath until hydrogen chloride ceases to be given off, adding very dilute solution of sodium hydroxide, shaking out the mixture with ether, drying the ether-solution with potassium carbonate, distilling off the ether, and rectifying the residual oily product by vacuum distillation, finally dissolving 30 per cent. of free menthol in the pure ester so obtained.

Validol is a crystal-clear, colorless liquid, of the consistency of glycerin, having a mild and pleasant odor, distinct from either that of menthol or valerian, and a refreshing cool and very faintly bitter taste, insoluble in water, but readily soluble in alcohol, ether, chloroform, and oils. It is decomposed by alkalies. On warming with sodium hydroxide solution, the odor of menthol manifests itself; if then the alkaline solution is acidulated with diluted sulphuric acid, the odor of valerianic acid is developed. It is incompatible with alkaline media.

Actions and Uses.—Analeptic, antihysteric, carminative, stomachic; combining the activity of valerianic acid and of menthol. It is devoid of the irritating acridity of the latter and is said to be well tolerated by the most sensitive stomach.

It is said to be useful in hysteria, migraine, gastralgia, gastritis, vomiting of pregnancy, exhaustion, hypochondria, syncope and certain reflex neuroses.

Dosage.—10 to 15 drops, on sugar, or in a little sweet wine.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany (C. Bischoff & Co., New York).

VALIDOL CAMPHORATUM.—Validol camphoratum is camphorated Validol.

Camphorated Validol is a 10 per cent. solution of camphor in validol. Camphorated Validol is a clear, colorless liquid, of the consistency of glycerin, having an agreeable odor, and refreshingly cool and faintly bitter taste. It is insoluble in water, but readily soluble in alcohol, oils and other organic solvents. It is incompatible with alkaline media.

Actions and Uses.—Restorative, local analgesic, non-irritant and non-poisonous; well tolerated by the mucous membrane of the stomach. It is said to be useful in serious cases of exhaustion, where the administration of camphor is indicated; in odontalgia, either by application to the pulp or inserted on cotton into the previously rinsed cavity.

Dosage.—10 to 15 drops, on sugar or in wine.

Manufactured by Vereinigte Chininfabriken, Zimmer & Co., Frankfort a. M., Germany (C. Bischoff & Co., New York).

VALYL—Valeryldiethylamidum.—Valerianic Acid Diethylamide.—Valyl is valeryl diethylamide, $C_5H_9CO.N(C_2H_5)_2 = C_9H_{19}ON$, a compound of valeric acid and diethylamine.

It is prepared by the direct interaction of its acid and basic components.

It is a bright, colorless, neutral liquid, having a peculiar pepper-like odor, boiling at 210° C. (410° F.). It is soluble in 25 parts of water and easily soluble in alcohol or ether.

It should be neutral to moistened litmus paper and the boiling point should not vary materially above or below that indicated.

It should not be exposed to the air.

Actions and Uses.—Valyl acts as a sedative, antispasmodic and nervine, similar to valerian.

It is said to be useful in hysteria, traumatic neurosis, hemicrania, neuralgia, menstrual irregularities, insomnia due to nervousness, etc.

Dosage.—Owing to the liability of valyl to oxidize when exposed to the air, it is supplied only in the form of pearls, each containing 0.125 Gm. (2 grains), the dose being 2 or 3 capsules, administered during or immediately after meals, or otherwise with a little milk.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M., Germany (Victor Koechl & Co., New York). U. S. patent No. 697,730 (April 15, 1902; expires 1919).

VIOFORM. — Iodochloroxyquinolin. — Nioform. — Vioform is iodo-chlor-hydroxy-quinoline, $C_9H_4N.OH.I.Cl = C_9H_5ONClI$, a substitution compound of anachlor-orthohydroxy-quinoline, resulting from the introduction of one atom of iodine.

Hydroxy-quinoline is first chlorinated and dissolved in an alkaline solution, which is then treated with a solution of iodine in potassium iodide when a voluminous yellowish brown precipitate of vioform is produced. This is washed with a solution of sodium thiosulphate to remove free iodine and then with 1 per cent. hydrochloric acid until the dried residue melts at from 170° to 175° C. (338° to 347° F.).

It is a very voluminous, greenish yellow powder; crystallizing from glacial acetic acid in needles melting at 177° to 178° C. (350.6° to 352.4° F.), practically odorless, and insoluble in water and slightly soluble in alcohol; it permits sterilization without decomposition; it is about six times as bulky as iodoform.

Vioform contains 41.57 per cent. of iodine—it gives a green coloration with Millon's reagent or when the alcoholic solution is treated with ferric chloride solution. It dissolves with a brown color in concentrated sulphuric acid and the solution evolves iodine on warming. If this solution, after driving off the iodine, be diluted with water, chlorine can be demonstrated by the usual test with silver nitrate. If a solution of vioform in chloroform is shaken with nitric acid, the chloroform acquires a violet red color, and the nitric acid becomes somewhat yellow.

Actions and Uses.—It is antiseptic, hemostatic, cicatrisant; non-toxic and non-irritant. It is claimed to be an ideal substitute for iodoform and to prevent decomposition in wound secretions to a much higher degree. Drains and tampons may be left *in situ* for a considerable time.

Dosage.—As a dusting powder and as an ointment spray, suppository, or in form of gauze.

Manufactured by Baseler Chemische Fabrik, Basel, Switzerland (C. Bischoff & Co., New York). German patent No. 117,767.

Vioform Gauze.—Gauze impregnated with a solution of 10 Gm. (150 grains) of vioform, 50 Gm. (750 grains) of absolute alcohol, 10 Gm. (150 grains) of sugar, 25 Gm. (375 grains) of glycerin, and 500 Gm. (1 1/12 pints) of water.

XEROFORM—Bismuthi Tribromphenolas.—Tribromphenol-Bismuth.—Xeroform is basic bismuth tribrom-phenolate, Bi-$(C_6H_2Br_3O)_2OH.Bi_2O_3 = C_{12}H_5O_6Br_6Bi_3$, containing nearly 50 per cent. of Bi_2O_3.

According to the patent it is obtained by dissolving tribromphenol in sodium hydroxide and adding bismuth nitrate to the sodium tribromphenolate solution. The precipitated tribromphenol bismuth is collected, and washed with alcohol.

It is a fine yellow, nearly odorless and tasteless powder, neutral in reaction, and unaffected by light. It is insoluble in water, alcohol, chloroform, liquid petrolatum and vegetable oils, but soluble in 2 per cent. hydrochloric acid in the proportion of 30:100. By alkalies it is decomposed with the formation of bromides; it is not decomposed by heat at temperatures below 120° C. (248° F.), and therefore may be sterilized.

It should yield 49.5 per cent. of bismuth oxide. If 1 Gm. is boiled with sodium hydroxide T. S. filtered, the filtrate rendered acid with sulphuric acid and the white, curdy precipitate washed and dried, it should melt at 95° C. (203° F.) (tribromphenol).

It is incompatible with alkaline media and should not be heated above 120° C. (248° F.).

Actions and Uses.—Xeroform is claimed to be non-irritant and non-toxic antiseptic. It is said to be useful as an odorless and efficient substitute for iodoform; as valuable in *ulcus cruris* and all weeping eczemas; internally, in gastrointestinal catarrh, proctitis, dysentery, bacillary and choleraic diarrhea, cholera infantum, etc. (See note under Creosote Carbonate.)

Dosage.—1 to 3 Gm. (15 to 45 grains) per day to adults; 0.12 to 0.3 Gm. (2 to 5 grains) at a dose to children. Externally, as a dusting powder, in bandages, etc., like iodoform.

Manufactured by the Heyden Chemical Works, New York. U. S. patent No. 516,358 (March 13, 1894; expires 1911).

ZINC PERMANGANATE.—Zinci Permanganas.—Zinc permanganate, Zn $(Mno_4)_2 + 6H_2O$ is the zinc salt of permanganic acid. It should contain not less than 90 per cent. of zinc permanganate.

Zinc permanganate occurs in dark brown, nearly black, lustrous deliquescent crystals, or crystalline masses. It is readily soluble in water (1 in 3), generally leaving a slight residue. Aqueous solutions decompose in air, but are permanent if kept in well-closed bottles, protected from light. When heated slowly it loses water of crystallization (25.46 per cent.) and oxygen, leaving a residue of zinc manganite. If heated quickly it gives off pink vapors, or more properly, a fine dust of manganese trioxid. Zinc permanganate gives up oxygen more easily than does the potassium salt, hence great care should be taken in bringing it in contact with easily oxidizable substances.

Zinc permanganate should be almost completely soluble in water. The color of the solution is discharged by alcohol, hydrogen sulphid, ferrous sulphate, oxalic acid, or hydrogen dioxid, especially if the solution is first rendered acid with sulphuric acid.

Tests.—If 1 Gm. of the salt is dissolved in 50 Cc. of water and 5 Cc. of alcohol added, a colorless solution must be obtained after boiling and filtering; if a small part of the latter acidified with nitric acid is tested with silver nitrate T. S. for chlorid and with barium chlorid T. S. for sulphate, not more than traces of either should be indicated.

To estimate its purity, 0.1 to 0.2 Gm. of substance is weighed, dissolved in water, filtered through asbestos, the filtrate acidulated with 5 Cc. dilute sulphuric acid, warmed to about 60° C., treated with an excess of tenth-normal oxalic acid V. S., and the excess of oxalic acid determined by titration with N/10 potassium permanganate V. S. Each cubic centimeter of tenth-normal oxalic acid V. S. consumed indicates 0.0040842 Gm. zinc permanganate, $Zn(MnO_4)_2 + 6.H_2O = 408.42$.

Action and Uses.—Zinc permanganate resembles the potassium salt in its oxidizing properties, but is more astringent. It is antiseptic. It is used chiefly in urethritis, either as an injection or as a urethral douche.

Dosage.—Locally 1 part to 4,000 (1 grain in 8 fluidounces). 1.3 Gm. zinc permanganate is equal in permanganate content to 1 Gm. potassium permanganate.

Non-Proprietary Preparations:

Zinc Permanganate, P.-W.-R.—Manufactured by the Powers-Weightman-Rosengarten Co., Philadelphia, Pa.

Zinc Permanganate, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

Tablets Zinc Permanganate, 1 grain, Mulford.—Each tablet contains zinc permanganate 0.065 Gm. (1 grain). Prepared by the H. K. Mulford Co., Philadelphia, Pa.

'Soloid' Zinc Permanganate, 1/8 grain, B.-W. & Co.—Each tablet contains zinc permanganate 0.008 Gm. (⅛ grain). Prepared by Burroughs-Wellcome & Co., London and New York.

ZINC PEROXIDE—Zinci Peroxidum.—Zinc Peroxide is the zinc salt, ZnO_2, of hydrogen peroxide, containing an admixture of not more than 55 per cent. of zinc oxide.

Zinc peroxide occurs as a yellowish white voluminous powder; tasteless, odorless, non-hydroscopic, antiseptic, neither caustic nor irritant, and not more toxic than ordinary zinc oxide. It is insoluble in water, but gives to it a slight alkaline reaction; it is soluble in cold dilute sulphuric acid with evolution of oxygen and in dilute hydrochloric acid with liberation of chlorine. It gives all the reactions of peroxides, caramelizes sugar, disengages oxygen by the action of acids and in contact with living tissue. It is stable in the autoclave to 130° C. and at a dry heat to 150° C., and thus may be readily sterilized. Heated to higher temperature, it loses oxygen and forms zinc oxide. It should not respond to tests for calcium, magnesium, barium, sulphates, chlorides or carbonates.

0.2-0.3 Gm. zinc peroxide accurately weighed and added to 50 Cc. water and acidulated with 20 Cc. dilute sulphuric acid, should require for each 0.1 Gm. material used not less than 9.25 Cc. dilute tenth-normal permanganate solution to produce a permanent pink color.

Action and Uses.—Zinc peroxide is used in the extemporaneous preparation of hydrogen peroxide for wounds, chronic ulcers, etc. It may be applied as a dressing directly on wounds, etc., where it produces hydrogen peroxide *in situ*. For eczema and other skin diseases it is sometimes prescribed with half its weight of potassium iodide and one-tenth its weight of tartaric acid, the mixture liberating iodine on contact with moist surfaces.

Dosage.—It may be used as a dusting powder either alone or mixed with tannin, or in the form of gauze, or a 10 per cent. ointment.

Proprietary Preparation:

PEROXIDE ZINC SOAP—Sapo cum zinci peroxido.—Peroxide Zinc Soap is a soap containing 10 per cent. zinc peroxide, which see.

Actions and Uses.—It is said to be useful as a vehicle for employing zinc peroxide in the treatment of skin diseases.

Prepared by J. Eavenson & Sons, Camden, N. J., for the Roessler & Hasslacher Chemical Co., New York. U. S. patent No. 787,776 (April 18, 1905; expires 1922). No trademark.

APPENDIX.

An index to the proprietary articles, arranged under the names of the manufacturers or their agents, which, so far as known to the Council, comply with the rules, but which did not possess sufficient originality to be admitted to the body of the book (see Introduction to Official Rules of the Council, page 9).

Edward G. Binz Co., Los Angeles, Cal.

Eucaloids.—Gelatine capsules, each said to contain pure oil of eucalyptus 0.3 Cc. (5 minims).

Euca-Mul.—An emulsion of oil of eucalyptus in glycerin and honey, said to contain oil of eucalyptus 3.25 Cc. in 100 Cc. (15 minims in a fluid ounce).

Burroughs, Wellcome & Co., New York.

Enule Soap Compound.—A cocoa butter suppository weighing 2.52 Gm. (39 grains) and containing in each suppository curd soap and dry sodium sulphate 0.454 Gm. (7 grains) of each.

Tabloid Hypophosphites Comp.—Each tablet is said to contain: Sodium hypophosphite, 0.0084 Gm. (⅛ grain); potassium hypophosphite, 0.0084 Gm. (⅛ grain); iron hypophosphite, 0.0084 Gm. (⅛ grain); manganese hypophosphite, 0.0042 Gm. (1/16 grain); quinine hypophosphite, 0.0021 Gm. (1/32 grain); strychnine hypophosphite, 0.0005 Gm. (1/128 grain); calcium hypophosphite, 0.0663 Gm. (1 3/128 grain).

*Tabloid Coffee Mint.**—Each tablet said to contain: Sodium bicarbonate, 0.2 Gm. (3 grains); ammonium carbonate, 0.004 Gm.

* This article and all others thus starred do not comply with the present rules of the Council. Having been accepted before the revision of the rules the Council decided to retain them for the present in the appendix.

(1/16 grain); extract of coffee (obtained by extracting roasted coffee with water, the percolate being evaporated, dried and powdered), 0.032 Gm. (½ grain); cerium oxalate, 0.016 Gm. (¼ grain); oil of peppermint to flavor.

G. W. Carnrick Co., New York.

*Antithermoline.**—Each 1000 Gm. is said to contain purified kaolin, 563 Gm.; boric acid, 2 Gm.; oil of eucalyptus, menthol and thymol, combined, 2 Gm.; and glycerine, 320 Cc. It closely resembles Cataplasma Kaolini, U. S. P.

Cloftlin Chemical Co., New York.

*Emulsion Clofflin.**—Each 100 Cc. is said to contain calcium hypophosphite, 1.33 Gm. (6 grains in a fluidounce); manganese hypophosphite, 0.66 Gm. (3 grains in a fluidounce); glycerin, 10 per cent.; cod liver oil, 50 per cent. (by volume).

Eusoma Pharmaceutical Co., Cincinnati, O.

Mercuran.—It is stated to be a 50 per cent. mercurial ointment in which the benzolnated lard of the official ointment (Unguentum Hydrargyri U. S. P.) has been replaced by goose fat stearin. It is supplied in capsules containing about 4 Gm. (60 grains) each.

Louisville Pharmacal Works, Louisville, Ky.

Elixir Duozyma.—Elixir Pepsin, Diastase and Hydrastis, L. P. W. A mixture said to represent in each 100 Cc.: pure scale pepsin (1:3000) 2.2 Gm. (10 grains in a fluidounce); malt diastase 0.22 Gm. (1 grain in a fluidounce); golden seal 0.22 Gm. (1 grain in a fluidounce); glycerin, C. P., 10 Cc. (48 minims in a fluidounce) and alcohol 15 per cent.

Malt-Diastase Co., New York.

Maltzyme.—A preparation essentially equivalent to Extractum Malti U. S. P. and containing 7 per cent. of alcohol. U. S. trademark No. 46,459.

Maltzyme with Cod Liver Oil.—Said to consist of maltzyme concentrated and brought back to its original volume by the addition of 25 per cent. of Lofoten cod liver oil.

Maltzyme with Cascara Sagrada.—Each 100 Cc. is said to represent cascara bark, 10 Gm. (48 grains in a fluidounce).

Maltzyme with Hypophosphites.—Each 100 Cc. is said to contain calcium, sodium, and potassium hypophosphites, of each 0.4 Gm. (2 grains in a fluidounce) and iron and manganese hypophosphites, of each, 0.05 Gm. (¼ grain in a fluidounce).

Maltzyme with Phosphate of Iron, Quinine and Strychnine.—Each 100 Cc. is said to contain iron pyrophosphate, 0.85 Gm. (4 grains in a fluidounce); quinine, 0.20 Gm. (1 grain in a fluidounce); strychnine, 0.0066 Gm. (2/75 of a grain in a fluidounce).

Maltzyme Ferrated.—Each 100 Cc. is said to contain iron pyrophosphate, 1.65 Gm. (8 grains in a fluidounce).

Maltzyme with Yerba Santa.—Each 100 Cc. is said to represent yerba santa leaves, 6.6 Gm. (30 grains in a fluidounce).

The Maltine Company, Brooklyn, N. Y.

Maltine.—A preparation essentially equivalent to Extractum Malti U. S. P. and containing 3.88 per cent. alcohol. U. S. trademark No. 44,556.

Maltine with Cascara Sagrada.—Each 100 Cc. is said to represent cascara sagrada (Rhamnus Purshiana) 12.5 Gm. (60 grains in a fluidounce) in a mixture containing maltine 96.115 per cent. and alcohol 3.885 per cent.

Maltine with Cod Liver Oil.—A liquid said to represent maltine, 56.115 per cent.; glycerin, 10 per cent.; cod liver oil, 30 per cent.; alcohol, 3.885 per cent.

Maltine with Creosote.—Each 100 Cc. is said to represent beechwood creosote, 0.83 Cc. (4 minims in a fluidounce) in a mixture containing maltine, 96.115 per cent., and alcohol, 3.885 per cent.

Maltine Ferrated.—Each 100 Cc. is said to represent iron pyrophosphate 1.65 Gm. (8 grains in a fluidounce) in a menstruum containing maltine, 96.115 per cent., and alcohol, 3.885 per cent.

Maltine with Hypophosphites.—Each 100 Cc. is said to contain calcium hypophosphite, 0.64 Gm. (3 grains in a fluidounce), sodium hypophosphite, 0.64 Gm. (3 grains in a fluidounce), and iron hypophosphite, 0.42 Gm. (2 grains in a fluidounce), dissolved in a solution of ammonium citrate and to contain maltine, 96.115 per cent., and alcohol, 3.885 per cent.

Maltine with Olive Oil and Hypophosphites.—A preparation said to consist of maltine, 65 per cent.; pure olive oil, 25 per cent.; glycerin, 10 per cent.; to which per 100 Cc. there is added calcium hypophosphite, 0.6 Gm. (3 grains per fluidounce); sodium hypophosphite, 0.6 Gm. (3 grains per fluidounce).

Maltine with Phosphate of Iron, Quinia and Strychnia.—Each 100 Cc. is said to represent iron pyrophosphate, 0.83 Gm. (4 grains in a fluidounce), quinine sulphate, 0.21 Gm. (1 grain in a fluidounce); strychnine (alkaloid), 0.0066 Gm. (2/75 grain in a fluidounce) dissolved in a solution of ammonium citrate and to contain maltine, 96.115 per cent., and alcohol, 3.885 per cent.

Maltine with Wine of Pepsin.—A liquid said to consist of maltine, 27.5 per cent.; wine of pepsin, 71.5 per cent.; and fluid extract of gentian, 1 per cent., the percentage of alcohol in the mixture being 18 per cent.

Malto-Yerbine.—A liquid said to contain in each 100 Cc. an extract of 6.6 Gm. (30 grains in a fluidounce) of eriodictyon (Yerba Santa), also flavoring composed of the essential oils of anise, cassia, coriander and caraway in a mixture containing maltine, 96.115 per cent. and alcohol, 3.885 per cent.

The extract of Yerba Santa employed in Malto-Yerbine is prepared as follows:

The leaves of Yerba Santa in coarse powder are boiled under pressure for six hours and inert matter separated by a filter press. The filtrate is concentrated with a certain quantity of maltine at a high temperature until the product has reached a density of 1.35. This extract is mixed in proper proportions with maltine of extra diastasic strength to make up for the diastasic strength lost through heat during the concentration of the drug with maltine.

Manhattan Eye Salve Co., Owensboro, Ky.

Argyrol Ointment (M. E. S. Co.).—An ointment said to consist of argyrol 10 per cent.; hydrous wool fat, 25 per cent.; white petrolatum, 65 per cent. Put up in collapsible tubes, for application to the eye.

Compound Yellow Oxide and Adrenalin Ointment (M. E. S. Co.).—An ointment said to contain yellow oxide of mercury 1 per cent., solution of adrenalin chloride 5 per cent., menthol 0.04 per cent., phenol 0.2 per cent., hydrous wool fat 25 per cent., white petrolatum sufficient to make 100 per cent. Put up in collapsible tubes, for application to the eye.

Cocaine and Adrenalin Ointment (M. E. S. Co.).—An ointment said to contain cocaine hydrochloride 2 per cent., solution of adrenalin chloride 17 per cent., hydrous wool fat 25 per cent., white petrolatum sufficient to make 100 per cent. Put up in collapsible tubes, for application to the eye.

Dionin Ointment (M. E. S. Co.).—An ointment said to consist of dionin 5 per cent.: white petrolatum, 95 per cent. Put up in collapsible tubes, for application to the eye.

Holocain and Adrenalin Ointment (M. E. S. Co.).—An ointment said to consist of holocain 1 per cent.; adrenalin chloride, 4 per cent.; hydrous wool fat, 10 per cent.; white petrolatum, 85 per cent. Put up in collapsible tubes for application to the eye.

Wm. S. Merrell Chemical Co., Cincinnati, O.

*Akaralgia.**—A mixture each 100 Cc. of which is said to represent sodium sulphate, 25 Gm.; sodium salicylate, 8.33 Gm.; magnesium sulphate, 42.5 Gm.; lithium benzoate, 4.16 Gm.; tincture of nux vomica, 5 Cc. Each average dose of 2 drams is said to represent sodium sulphate 30 grains, sodium salicylate (Merrell) 10 grains, magnesium sulphate 50 grains, lithium benzoate 5 grains and tincture of nux vomica 6 minims.

Erpiol—Dr. Shrader.—Capsules stated to contain in each: Apiol, green (see Oleoresin of Parsley Seed), 0.31 Cc. (5 minims); Ergotin, Bonjean's process (see Purified Extract of Ergot), 0.065 Gm. (1 grain); Gossypin, resinoid, 0.195 Gm. (3 grains).

H. K. Mulford Co., Philadelphia, Pa.

*Blandine Comp.**—A liquid said to contain in each 100 Cc.: Camphor, 0.3 Gm. (1½ grains in a fluidounce); menthol, 0.04 Gm. (1/5 grain in a fluidounce); thymol, 0.04 Gm. (1/5 grain in a fluidounce); eucalyptol, 0.08 Gm. (2/5 grain in a fluidounce); oil of gaultheria, 0.33 Cc. (1½ minims in a fluidounce); hydrastine alkaloid, 0.005 Gm. (1/40 grain in a fluidounce) in a neutral, odorless mineral oil (liquid petroleum). U. S. trademark No. 51,647.

*Casca-Laxative.**—A liquid extract representing in each 100 Cc.: cascara sagrada, 116.6 Gm. (540 grains in a fluidounce); senna, 58.3 Gm. (270 grains in a fluidounce); podophyllin, 0.16 Gm. (¾ grain in a fluidounce); in a menstruum containing 17 per cent. of absolute alcohol by volume with aromatics.

Compound Capsules of Glycerophosphates. Capsula glycerophosphatum composita.—Each capsule is said to contain: Terebene, 0.12 Cc. (3 minims); oil of sandalwood, 0.2 Cc. (3 minims); guaiacol, 0.06 Cc. (1 minim) calcium glycerophosphate 0.06 Gm. (1 grain) sodium glycerophosphate, 0.03 Gm. (½ grain); strychnine 0.00065 Gm. (1/100 grain); pure olive oil sufficient to make 10 minims.

They are soft, oval shaped capsules of a clear, yellow color, with a small compressed tablet containing the glycerophosphates and strychnine suspended in the oils.

Methyl-Santal.—Each capsule is said to contain: Methylene blue, 0.06 Gm. (1 grain); oleoresin of copaiba, 0.1 Cc. (1 3/5 minims); oleoresin of cubebs, 0.025 Cc. (2/5 minim); oil of sandalwood, 0.025 Cc. (1½ minims); oil of cinnamomum, 0.013 Cc. (1/5 minim); oil of nutmeg, 0.005 Cc. (1/12 minim).

Granular Effervescent Sodium Sulphate (Glauber's Salt), Mulford.—A mixture said to contain in each 100 Gm.: Dried sodium sulphate, 40 Gm., with an effervescing mixture consisting of sodium bicarbonate, citric acid, tartaric acid, and sugar. Each heaping teaspoonful weighing about 75 grains is said to contain dried sodium sulphate, 30 grains.

Granular Effervescent Bromide and Acetanilide Compound, Mulford.—A mixture said to contain in each 100 Gm.: Sodium bromide, 5 Gm., acetanilide, 1.5 Gm., and saccharin, 0.014 Gm., with an effervescent base consisting of sodium bicarbonate, and citric and tartaric acids. Each heaping teaspoonful of this salt, about 100 grains, is said to contain about 1.5 grains acetanilide, about 5 grains sodium bromide, and about 1/70 grain of saccharin.

Granular Effervescent Caffeine and Sodium Bromide Compound, Mulford.—A mixture said to contain in each 100 Gm.: Sodium bromide, 5.45 Gm.; caffeine, 0.545 Gm.; and saccharin, 0.014 Gm., with an effervescent base consisting of sodium bicarbonate, and citric and tartaric acids. Each heaping teaspoonful of this salt, about 92 grains, is said to contain about 5 grains sodium bromide, ½ grain, caffeine, and about 1/70 grain of saccharin.

Granular Effervescent Caffeine and Potassium Bromide, Mulford.—A mixture said to contain in each 100 Gm.: Potassium bromide, 2.3 Gm.; caffeine, 0.122 Gm.; and saccharin, 0.014 Gm., with an effervescent mixture consisting of sodium bicarbonate, and citric and tartaric acids. Each ounce is said to contain about 10 grains of potassium bromide, about 2 grains of caffeine, and about 1/16 grain of saccharin.

Granular Effervescent Carlsbad Salt (Artificial), Mulford.—A mixture said to contain in each 100 Gm.: Potassium sulphate, 0.35 Gm.; sodium chloride, 3.266 Gm.; sodium bicarbonate, 6.533 Gm., and sodium sulphate (dried), 8 Gm., with an effervescent base consisting of sodium bicarbonate, and citric and tartaric acids. Each heaping teaspoonful of the salt, about 90 grains, is said to contain about ½ grain of potassium sulphate, 3 grains of sodium chloride, 6 grains of sodium bicarbonate and 7 grains of sodium sulphate (dried).

Granular Effervescent Carlsbad Salt (Artificial) with Phenolphthalein, Mulford.—A mixture said to contain in each 100 Gm.: Potassium sulphate, 0.35 Gm.; sodium chloride, 3.266 Gm.; sodium bicarbonate, 6.553 Gm.; sodium sulphate (dried), 8 Gm., and phenolphthalein, 1.1 Gm., with an effervescent base consisting of sodium bicarbonate, and citric and tartaric acids. Each heaping teaspoonful of the salt will average about 90 grains and is said to contain about ½ grain of potassium sulphate, 3 grains of sodium chloride, 6 grains of sodium bicarbonate, 7 grains of sodium sulphate (dried) and about 1 grain of phenolphthalein.

Guaiacol Carbonate Comp.—Soft, elastic, soluble capsules, each of which is said to contain: Guaiacol carbonate, 0.09 Gm. (1½ grains); calcium hypophosphite, 0.03 Gm. (½ grain); ichthyol, 0.03 Gm. (½ grain), strontium arsenite, 0.00055 Gm. (1/120 grain), and olive oil sufficient to make 0.3 Cc. (5 minims). Trademark not registered.

National Pharmacy Co., Oakland, Cal.

Bismuthal.—A milky liquid, said to contain in 100 Cc. lac bismuthi citratis, 44 Cc.; pepsin, 3.30 Gm.; hydrochloric acid, 0.013 Gm.; lactic acid, 0.013 Gm.; glycerin, 40 Gm., and alcohol, 5 Cc.; cherry laurel water, 1.66 Cc.; Jamaica ginger, 0.26 Gm.; gum benzoin, 0.59 Gm. Each dose of 1 fluidram is said to contain approximately: Lac bismuthi citratis, 26 minims; pepsin, 2 grains; hydrochloric acid, 8/1000 grain; lactic acid, 8/1000 grain; glycerin, 24 grains; alcohol, 3 minims; cherry laurel water, 1 minim; Jamaica ginger, 1/6 grain; gum benzoin, ⅛ grain.

Lac bismuthi citratis contains 7.60 per cent. of anhydrous bismuth citrate. It is made by double decomposition between bismuth trinitrate and sodium citrate, decanting the supernatant liquid and washing the precipitate.

Pitman-Myers Co., Indianapolis, Ind.

Aromatic Cordial, P.-M. Co.—Aromatic cordial is a mixture said to contain in each 100 Cc.: Papain, 0.4 Gm., and lactic acid, 0.625 Cc. in a menstruum consisting of glycerin wine, aromatics, sugar, and 5 per cent. of alcohol. One fluidram is said to contain papain, ¼ grain, and lactic acid, 4/10 minim.

Elixir Buchu, Juniper and Acetate Potassium, P.-M. Co.—Each 100 Cc. is said to represent: Buchu, 16.6 Gm.; juniper berries, uva ursi, of each, 8.3 Gm.; potassium acetate, 5 Gm. Each fluidram is said to represent: Buchu, 10 grains; juniper berries, uva ursi, of each, 5 grains, and potassium acetate, 3 grains.

Oleum Ricini Dulce, P.-M. Co.—Castor oil to which has been added saccharin 0.07 Gm. in 100 Cc. (0.33 in a fluidounce) and aromatics; contains 2.5 per cent. alcohol.

Syrup Cannabis Compound.—Each 100 Cc. is said to represent: Cannabis indica, 1.66 Gm. (7½ grains in a fluidounce); heroin hydrochloride, 0.066 Gm. (⅛ grain in a fluidounce); chloroform, 0.83 Cc. (4 minims in a fluidounce); lobelia, 1.66 Gm. (7½ grains in a fluidounce); antimony and potassium tartrate (tartar emetic), 0.026 Gm. (⅛ grain in a fluidounce), with aromatics; alcohol, 10 per cent.

Tablets Acet-Phenetidin Compound, P.-M. Co.—Tablets, each stated to contain acet-phenetidin 0.23 Gm. (3½ grains); caffein, 0.016 Gm. (¼ grain) and sodium bicarbonate, 0.08 Gm. (1¼ grains).

Reinschild Chemical Co., New York.

Extractum Chinae Nanning.—A liquid extract of red chinchona said to contain cinchona alkaloids 5 per cent., cinchona tannins 7½-10 per cent., glycerine 30 per cent., water 55-57½ per cent.

Dosage.—1 to 1.25 Gm. (15 to 20 minims) three times a day.

*Regulin.**—A mixture of agar-agar in a dry form with extract of cascara sagrada representing 15 per cent. of an aqueous fluid extract of cascara sagrada.

Actions and Uses.—See Agar-agar. Regulin is used for the the treatment of habitual constipation.

Dosage.—From a teaspoonful to a tablespoonful once daily in stewed apples, mashed potatoes or similar food.

U. S. patent No. 896,807 (Aug. 25, 1908; expires 1925).

Russell & Lawrie, Tarrytown, New York.

*Lubraseptic.**—Lubraseptic is a jelly prepared from Chondrus (Irish moss) containing 2 per cent. boric acid and 0.067 per cent. formaldehyde.

The material is packed in screw cap metal tubes and sterilized by heat.

Dosage.—It is put up in collapsible tubes and it is suggested to reject the portion first expressed to make sure of the sterile condition of that used.

Schering & Glatz, New York.

*Tonols.**—Tonol is a name applied by E. Schering to identify the glycerophosphates of his manufacture. The following are mentioned: Calcium (or lime) tonol, Iron tonol, Lithium tonol, Magnesium tonol, Manganese tonol, Potassium tonol, Quinine tonol, Strychnine tonol. U. S. trademark No. 59,094.

*Duotonol.**—A mixture of equal parts of calcium tonol and sodium tonol. U. S. trademark.

*Quartonol.**—A name applied to a mixture of tonols in tablets of 0.3 Gm. (5 grains), each tablet being said to contain: Lime tonol, 0.148 Gm. (2¼ grains), sodium tonol, 0.148 Gm. (2¼ grains); quinine tonol, 0.03 Gm. (½ grain), and strychnin tonol, 0.00032 Gm. (1/200 grain). U. S. trademark.

*Sextonol.**—A mixture of tonols in tablets of 0.3 Gm. (5 grains), each tablet being said to contain: Lime tonol, 0.13 Gm. (2 grains); sodium tonol, 0.13 Gm. (2 grains); iron tonol, 0.03 Gm. (½ grain); manganese tonol, 0.015 Gm. (¼ grain); quinine tonol, 0.015 Gm. (¼ grain), and strychnine tonol, 0.00032 Gm. (1/200 grain). U. S. trademark.

* For significance of star see foot-note under Tabloid Coffee Mint, p. 70.

Trikresol.—A liquid said to consist of: Orthocresol, 35 per cent.; metacresol, 40 per cent., and paracresol, 25 per cent. It closely corresponds to Cresol, U. S. P. U. S. trademark No. 65,624.

Schieffelin & Co., New York.

*Colalin Laxative.**—Tabella Colalinæ cum Extracto Rhamni Purshianæ, Crowell. Each tablet is said to contain colalin, 0.015 Gm. (¼ grain), powdered extract of cascara, 0.12 Gm. (2 grains), and podophyllin, 0.01 Gm. (1/6 grain).

Dosage.—One to three tablets on retiring or one after each meal.

*Elixir Eupnein.**—A preparation each 100 Cc. of which is said to contain: Heroin, 0.0325 Gm.; terpin hydrate, 1.625 Gm.; creosote, 3.75 Gm., in a menstruum containing 30 per cent. of alcohol, with glycerin and aromatic essential oils. Each dose of 2 fluidrams is said to contain: Heroin, 1/24 grain; terpin hydrate, 2 grains, and creosote, 5 grains. U. S. trademark No. 36,419.

*Hemoquinine.**—Each 100 Cc. is said to contain: So-called peptonate of iron (made by adding ammoniocitrate of iron to freshly prepared peptone of egg albumin), 7.2 Gm., and so-called peptonate of manganese, 1.8 Gm., together with: Quinine peptonate (equivalent to 0.5 Gm. of quinine sulphate). 1.0 Gm., and sodium arsenate, 0.266 Gm., in a menstruum containing 20 per cent. of alcohol with glycerin and aromatics. Each dose of 2 fluidrams is said to contain: Peptonate of iron, 8½ grains; peptonate of manganese, 2¼ grains, peptonate of quinine, 1 grain, and sodium arsenate, 1/36 grain. U. S. trademark No. 38,512.

*Heromal.**—Each 100 Cc. is said to contain: Heroin, 0.01625 Gm. and sodium hypophosphite, 0.375 Gm., in a menstruum of malt extract, with 6 per cent. of alcohol. Each dose of 2 fluidrams is said to contain: Heroin, 1/48 grain, and sodium hypophosphite, ½ grain. U. S. trademark No. 37,010.

Heroterpine.—Each 100 Cc. is said to contain: Terpin hydrate, 1.625 Gm., and heroin, 0.0325 Gm., in a menstruum containing 32 per cent. of alcohol, with glycerin and aromatic essential oils. Each average dose of 2 fluidrams is said to contain: Terpin hydrate, 2 grains, and heroin, 1/24 grain. U. S. trademark No. 36,181.

Laminoids Ferruginous (Nascent).—Each tablet contains iron sulphate and sodium bicarbonate in quantities equivalent to those of pilulæ ferri carbonatis (Blaud's pills), but the two salts are separated into two layers so that the formation of ferrous carbonate will occur only when the tablets are moistened. An excess of bicarbonate is present. U. S. trademark No. 38,384.

*Neuronidia.**—An elixir said to contain in each 100 Cc.: Veronal (Diethyl-Barbituric Acid), 3.25 Gm. in a menstruum containing 35 per cent. of alcohol, with aromatics. Each dose of 2 fluidrams is said to contain veronal, 4 grains. U. S. trademark No. 44,141.

*Uriform.**—Each 100 Cc. is said to represent: Hexamethylenetetramine, 6.25 Gm.; saw palmetto, 4.16 Gm.; santal, 2.08 Gm.; damiana, 2.08 Gm., and nux vomica, 0.2 Gm., in a menstruum containing 20 per cent. of alcohol, with sugar and aromatics. Each dose of 2 fluidrams is said to contain: Hexamethylenetetramine, 7½ grains; saw palmetto, 5 grains; santal, 2½ grains; damiana, 2½ grains, and nux vomica, ¼ grain. U. S. trademark No. 37,924.

Leonard A. Seltzer, Detroit, Mich.

*Euscmine.**—A sterile solution, in hermetically sealed vials, of: Cocaine hydrochloride, 0.0075 Gm. (0.116 grains), and Adrenalin hydrochloride, 0.00005 Gm. (0.008 grains), dissolved in physiologic salt solution, 1 Cc.

Sharp & Dohme, Baltimore, Md.

Compressed Tablets Anesthesin, 2 1/2 grains.—Each tablet contains anesthesin, 0.162 Gm. (2½ grains).

Solution Atoxyl 10 per cent. (Sterilized).—Each 100 Cc. contain atoxyl, 10 Gm. (each fluidounce contains atoxyl, 48 grains), dissolved in distilled water.

Ampules Solution Atoxyl, 10 per cent. (Sterilized).—Each 100 Cc. contain atoxyl, 10 Gm. (each fluidounce contains 48 grains), dissolved in distilled water.

Ampules Solution Atoxyl, 10 per cent., with Novocaine, 1 per cent. (Sterilized).—Each 100 Cc. contain: Atoxyl, 10 Gm., and novocaine, 1 Gm. (each fluidounce contains: Atoxyl, 48 grains, and novocaine, 4 8/10 grains), dissolved in distilled water.

Compressed Tablets Atoxyl and Iron.—Each is said to contain: Atoxyl, 0.02 Gm. (⅓ grain), and ferrous lactate, 0.06 Gm. (1 grain).

Compressed Tablets Atoxyl and Quinine Comp.—Each tablet contains: Atoxyl, 0.01 Gm. (1/6 grain), quinine hydrochlor, 0.022 Gm. (⅓ grain), strych. nitrate, 0.0043 Gm. (1/150 grain), ferrous carbonate mass (Blaud), 0.162 Gm. (2½ grains).

Compressed Tablets Benzosol, 2 1/2 grains.—Each tablet contains benzosol 0.162 Gm. (2½ grains).

Compressed Tablets Benzosol and Codeine.—Each tablet contains: Codeine sulph., 0.0054 Gm. (1/12 grain), and benzosol, 0.162 Gm. (2½ grains).

Compressed Tablet Blaud with Atoxyl.—Each tablet contains Ferrous carb. mass (Blaud), 0.162 Gm. (2½ grains), and atoxyl 0.022 Gm. (⅓ grain).

Compressed Tablets Pyramidon, 1 1/2 grains.—Each tablet contains pyramidon, 0.097 Gm. (1½ grains).

Compressed Lozenges Orthoform, 1 grain.—Each lozenge contains orthoform, 0.065 Gm. (1 grain).

Compound Emulsion Petroleum, S. & D.—An emulsion containing: Refined petroleum, 28⅓ per cent.; petrolatum oil, 5 per cent., with calcium hypophosphite, 2.2 Gm., and sodium hypophos-

phite, 2.2 Gm. in each 100 Cc. Each dose of 4 fluidrams is said to contain: Calcium hypophosphite, 5 grains, and sodium hypophosphite, 5 grains.

Liquor Santaiva.—Liquor Santali et Copaibae Compositus, S. & D.—Each 100 Cc. contains Santal oil 1 Cc. (5 minims in a fluidounce) and copaiba 2 Cc. (10 minims in a fluidounce) dissolved in 55 per cent. alcohol with addition of aromatic oils.

Solution Atoxyl, 10 per cent., with Novocaine, 1 per cent. (Sterilized).—Each 100 Cc. contain: Atoxyl, 10 Gm., and novocaine, 1 Gm. (each fluidounce contains atoxyl, 48 grains, and novocaine, 4 8/10 grains), dissolved in distilled water.

Soluble Hypodermic Tablets Atoxyl, 1/3 grain.—Each tablet contains atoxyl, 0.02 Gm. (⅓ grain).

Soluble Hypodermic Tablets Novocaine, 1/3 grain.—Each tablet contains novocaine, 0.02 Gm. (⅓ grain).

Soluble Tablets Novocaine, 1 1/7 grains.—Each tablet contains novocaine, 0.074 Gm. (1 1/7 grains).

*Tonic Hypophosphites.**—Each 100 Cc. is said to contain: Potassium hypophosphite, 0.33 Gm. (1½ grains in a fluidounce); iron hypophosphite, 0.33 Gm. (1½ grains in a fluidounce); manganese hypophosphite, 0.22 Gm. (1 grain in a fluidounce); calcium hypophosphite, 0.22 Gm. (1 grain in a fluidounce); quinine hypophosphite, 0.10 Gm. (½ grain in a fluidounce); strychnine hypophosphite, 0.013 Gm. (1/16 grain in a fluidounce.

F. H. Strong Co., New York.

*Cholegestin.**—A liquid of which 100 Cc. is said to contain the amorphous sodium salt of glycocholic acid, 0.858 Gm.; true sodium salicylate from the natural oil of wintergreen, 1.07 Gm.; pancreatin, 2.15 Gm.; sodium bicarbonate, 2.15 Gm., in a menstruum containing 15 per cent. alcohol. Each half ounce is said to contain the amorphous sodium salt of glycocholic acid, 2 grains; true sodium salicylate from the natural oil of wintergreen, 2½ grains; pancreatin, 5 grains; sodium bicarbonate, 5 grains. U. S. trademark No. 61,707.

Veroform Hygienic Co., New York.

Veroform Germicide.—A practically neutral liquid containing 20 per cent. of formaldehyde gas dissolved in a solution of soap.

Veroform Antiseptic.—A practically neutral liquid containing 6 per cent. of formaldehyde gas dissolved in a solution of soap. U. S. patent No. 740,424 (Oct. 6, 1903; expires 1920). U. S. trademark "Veroform" No. 44,144.

H. K. Wampole Co., Philadelphia.

Bismuth Hydrate Comp.—A mixture containing in each 100 Cc.: Alcohol, 2 per cent.; chloroform, 0.4 Cc. (2 minims in a fluidounce); fluidextract of red gum (eucalypti gummi), 6.6 Cc. (32 minims in a fluidounce); phenyl salicylate, 0.20 Gm. (1 grain in a fluidounce); pepsin, 0.8 Gm. (4 grains in a fluidounce); bismuth hydroxycarbonate, an amount corresponding to 1.2 Gm. (6 grains in a fluidounce); antiseptic oils and aromatics, and glycerin, 20 per cent. No patents or trademarks.

Colchi-Methyl Capsules.—Each capsule contains: Colchicine, 0.00025 Gm. (1/250 grain); phenyl salicylate (salol), 0.13 Gm.

Glyceradine.—Glyceritum acidi hydriodici. It is said to contain in each 100 Cc. hydrogen iodide (absolute hydriodic acid), 1.54 Gm. (7 grains in a fluidounce).

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